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United States
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Agriculture

Forest Service

Alaska
Region
R10-MB-78



Timber Supply and Demand

1988 Report

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Alaska National Interest Lands Conservation Act
Section 706(a), Report Number 8

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August 1989

PREFACE

Section 706(a) of the Alaska National Interest Lands Conservation Act (ANILCA) states that the Secretary of Agriculture will monitor timber supply and demand in Southeast Alaska and report annually on the ability of the Tongass National Forest to meet a timber supply rate of 4.5 billion board feet per decade specified in Section 705. This report is submitted to the Committee of Energy and Natural Resources of the U.S. Senate and the Committee on Interior and Insular Affairs of the House of Representatives. The report is prepared by the USDA Forest Service, Alaska Region in consultation with the State of Alaska, affected Native corporations, the Alaskan timber industry, the Southeast Alaska Conservation Council, and the Alaska Land Use Council in accordance with Section 706(c) of ANILCA. These parties are known as ANILCA cooperators.

Increasingly, Southcentral Alaska has become a participant with Southeast Alaska in the expanding Pacific Rim marketplace for wood products. Confirmation of this trend includes an expanding softwood log trade originating from Southcentral Alaska and the installation of a major new sawmill by the Chugach Alaska Native Corporation. To promote further communication and coordination between the public and private sector on forest management issues, this eighth timber supply and demand report includes references to the forest resources and industry's activities in Southcentral Alaska.

This report is based on information gathered by the USDA, Forest Service, from federal agencies, published reports, trade journals, etc. Comments on the draft report were solicited from the ANILCA cooperators and other industry experts, consultants, researchers, special interest groups, professional organizations, and interested individuals.

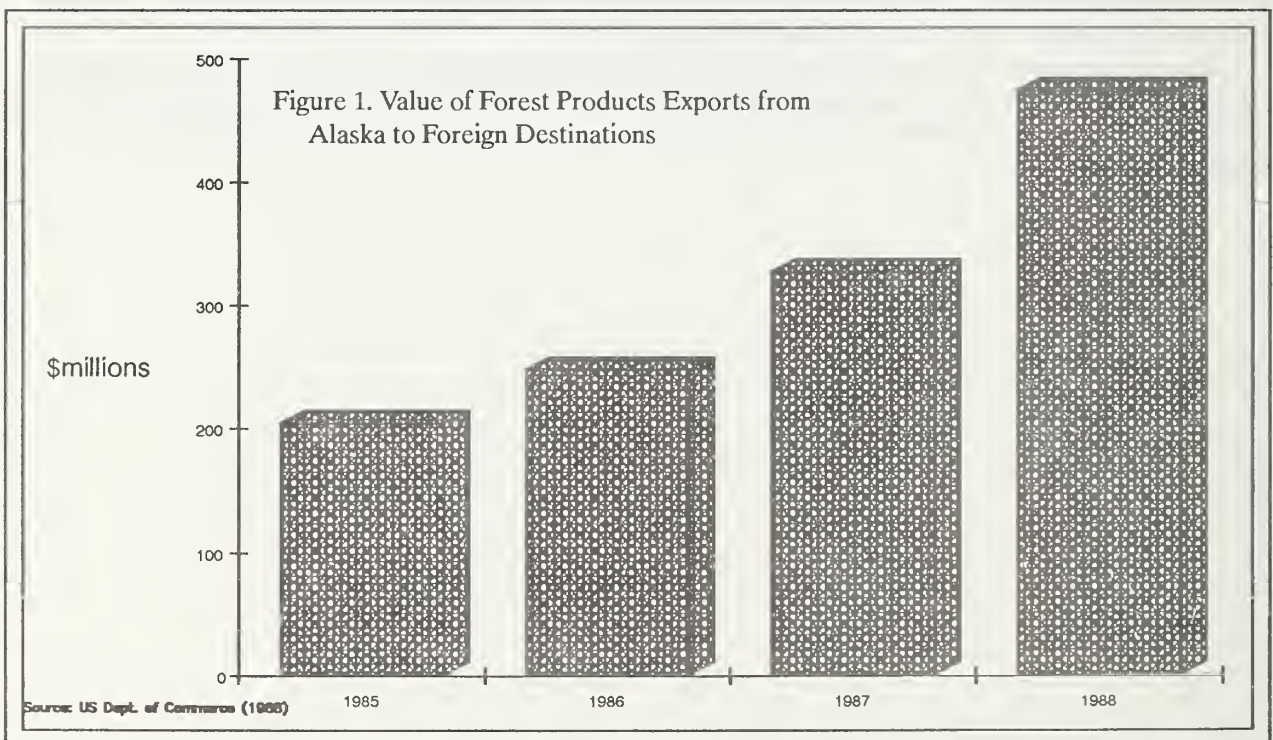
EXECUTIVE SUMMARY

Rapid Expansion of Exports

Continued economic expansion in the United States and the Pacific Basin coupled with a more internationally competitive dollar fueled rapid growth in Alaskan exports of forest products in fiscal year 1988 (October 1, 1987 - September 30, 1988). The value of forest products exported to foreign countries from Alaska has increased from \$204.5 million in fiscal year 1985 to \$474.7 million in fiscal year 1988 (Figure 1). The boost in competitiveness from currency shifts, plus market growth, lifted prices for some Alaskan forest products exports to new highs.

International exports of softwood logs from Alaska exceeded \$260 million in fiscal year 1988, growing 10.5 percent in volume from 436 million board feet(MMBF) last year to more than 482 MMBF this fiscal year. The average market value for all log exports climbed to an all-time high of \$543 per MBF. The major markets for Alaska's output of softwood logs in fiscal year 1988 were Japan, South Korea, Canada, Taiwan and China.

The value of Alaskan lumber exported to foreign destinations has more than doubled over the last two fiscal years rising from \$24.7 million in 1986 to more than \$52 million in 1988. Within the next year, continued expansion is expected as several Alaskan lumber processors begin production in new facilities. Lack of on-site power generation and kiln facilities continue to hinder efforts of Alaskan lumber manufacturers to tailor output to the specific needs of wholesalers and end-users abroad. A shortage of transoceanic containers and rising freight rates further compound, but have not prevented, increased diversification with an emphasis on further processing to add value to the Alaskan-produced product.



In addition to supplying domestic producers, Alaska's forest products industry exports high-quality pulp products which are competitive worldwide. In fiscal year 1988, Alaskan manufacturers exported \$160 million in pulp products to 16 countries in Asia, Europe and Latin America. The average market value for pulp exported from Alaska in fiscal year 1988 was a record \$559 per short ton(2000 pounds). Skyrocketing prices for paper-grade pulps in 1986-1987 encouraged suppliers with the ability to switch out of dissolving grades into chemical pulps to supply the rapidly growing market for printing and writing papers. This exodus of producers from the dissolving grades has Alaskan pulp manufacturers well-positioned to serve the rebounding market for dissolving pulp. With the market for chemical pulp still on the up-swing, good prices for dissolving pulp could continue, at least, through next summer.

Competition for Wood Fiber in the Pacific Rim Intensifies

The supply of wood fiber in Southeast Alaska and the Pacific Rim is tight. A clear indicator is the reappearance of an export market for wood chips. Japanese buyers returned to Southeast Alaska in fiscal year 1988 to acquire 11,500 short tons of chips. The resumption of an export market for chips means fuller utilization of wood residue on private lands with better incentives for forest management as competition for fiber intensifies.

Harvest on the Tongass National Forest increases 18 percent

National Forest timber harvest in fiscal year 1988 was up 18 percent from 1987. Sawtimber harvest on the Tongass was 331.5 MMBF. An additional 64.7 MMBF in utility volume was taken yielding a total harvest of 396.2 MMBF from the Tongass.

Implications for Resource Management

The strong market has fostered three trends which will promote the timber management objectives expressed in the Tongass Land Management Plan and ANILCA Section 705(a):

- 1) the industry is expanding manufacturing capacity with an emphasis on value-added processing;
- 2) increased harvests on the Tongass have improved the balance between Forest Service sales of timber and volume under contract with present and emerging markets; and
- 3) increased use of low-volume timber stands is resulting in a faster return of public monies invested in roads and log transfer facilities.

Demand for Timber from the Tongass National Forest through Fiscal Year 1992

Sawlog harvest on the Tongass is projected to increase from 331 MMBF in fiscal year 1988 to more than 400 MMBF by fiscal year 1992. A pause in the growth of harvest in 1990 or 1991 is possible as overseas markets adjust to any fiscal and monetary measures introduced by the United States to correct deficits in its federal budget and external trade balances. This projection is for sawlogs. The allowable sale quantity from the Tongass is based on sawlogs but timber-sale purchasers are required to remove utility-grade logs from timber sales. The projections assume no unforeseen macroeconomic events, shifts in domestic or foreign policy or substantial changes in currency alignments.

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Alaska's forests, under Forest Service management, produces timber principally to meet the growing demand for wood products in Pacific Rim countries.

INTRODUCTION

In Southeast Alaska, the forest products industry harvests and processes timber principally to meet the demand for wood products in Pacific Rim countries. The quantity of timber harvested and processed in Alaska each year depends on the industry's international competitiveness. Alaska's international competitiveness depends on resource supply in Alaska and abroad, demand for the product in the Pacific Rim, and finally, the competitiveness of the United States dollar with other currencies. This report estimates timber harvest in Southeast and Southcentral Alaska during fiscal year 1988 and describes the market conditions affecting the State's forest products industry.

First, the structure of Southeast Alaska's timber industry is discussed. Southeast and Southcentral Alaska timber harvests from Forest Service, Native corporations, State of Alaska, and other ownerships are estimated and displayed for the period 1980 to 1988. Imports of roundwood and chips are reported to complete the picture of raw material available to the forest products industry. The Forest Service timber and roading policies on the Tongass are described. The National Forest timber volume offered for sale since 1980 is compared to the timber harvest schedule outlined in the Tongass Land Management Plan (TLMP) to determine if a timber supply of 4.5 billion board feet per decade from the Tongass is available, as prescribed by Section 705(a) of ANILCA.

Second, this report describes changes in the Pacific Rim economy which are affecting Alaska's markets for softwood logs and lumber, as well as shifts in the global market which are altering the role of Alaska's dissolving pulp manufacturers. Provided next is a summary of the market conditions in the major softwood importing countries -- Japan, the Peoples Republic of China, Taiwan, and South Korea. Later in this section, a brief outlook is provided on the competing timber supplies from British Columbia, the Pacific Northwest, the Soviet Union, Chile, New Zealand and Australia. This section concludes with a forecast of harvest from the Tongass in fiscal years 1990 and beyond.

Finally, the employment, personal earnings and population dependent on timber harvest and processing in Southeast Alaska are reported. In that section, Tongass National Forest receipts are displayed by category, as well as the historical distribution of receipts to the State of Alaska.



The capacity to produce lumber in Alaska's sawmill industry increased from 236 MMBF in fiscal year 1987 to about 370-380 MMBF per annum in fiscal year 1988.



Compared to their operating capital, several sawmills have invested heavily in additional machinery and staff to add value to raw materials passing through their mills.

STRUCTURE OF THE FOREST PRODUCTS INDUSTRY

Historically, the timber industry in Southeast Alaska stems from the joint efforts of the Federal Government and the Territory of Alaska to promote greater economic stability in Southeast Alaska. Today's timber trade in the region has been heavily influenced by legislation encouraging new industry under the Alaska Native Claims Settlement Act of 1971 (ANCSA). The current level of timber harvest and processing activities in the region reflect opportunities to market forest products in Pacific Rim countries and the management policies of the USDA, Forest Service and the State of Alaska.

Currently, four sawmills and a number of small portable mills in Southeast Alaska produce cants, flitches and dimension lumber for export. Cants and flitches are semi-processed, rough sawn timbers meeting federal primary manufacturing requirements. In addition, two pulpmills produce dissolving pulp for both the U.S. domestic and export markets. Alaska's dissolving pulp is produced from wood fibers, and is a basic ingredient for rayon, cellophane and other specialized industrial and aerospace materials.

Under ANCSA, 13 private corporations were created in Southeast Alaska, and are entitled to 572,520 acres in Southeast Alaska. Approximately 90 percent of the ANCSA entitlements have been conveyed. Much of the land conveyed under ANCSA was forested and the timber is being harvested and exported as logs or sold to the two pulpmills.

Investing Today to Serve Future Markets

Two major facilities produce dissolving pulp in Southeast Alaska: The Alaska Pulp Corporation mill (APC) in Sitka and the Ketchikan Pulp Company mill (KPC) near Ketchikan. In fiscal year 1988, the two pulpmills operated near their maximum capacity producing just under 400 thousand short tons. Operating rates are expressed as the ratio of actual annual production to total production capacity. For comparison, operating rates averaged about 75 percent in 1987 and 70 percent in 1986. At capacity, the consumption of logs and residuals from sawmills is approximately 400 MMBF per year. Operating at full capacity and increasing demand for dissolving pulp has motivated these firms to announce major improvements and expansions in their facilities.

The capacity to produce lumber in the sawmill industry increased from 236 MMBF in fiscal year 1987 to about 370-380 MMBF per annum in fiscal year 1988. The two sawmills producing lumber and cants for ex-

port last year are operating at higher rates than a year ago, and have been joined by two more mills in 1988. The lumber and cant producers are Wrangell Forest Products, the Annette Hemlock mill (a joint operation between the Annette Indian Reservation and KPC), the Chilkoot Lumber Company in Haines, and Klawock Timber Alaska Inc., in Klawock. About nine smaller mills operate intermittently with a combined annual capacity of 36 MMBF. The average annual production for the individual small processor is normally less than 1 MMBF of softwood logs. Compared to their operating capital, several sawmills have invested heavily in additional machinery and staff to add value to the raw material passing through their mills. Wrangell Forest Products processes 60 percent dimensional lumber, less than 5 percent in cants, and the balance in graded flitches. 80 percent of the hemlock logs passing through the Chilkoot Lumber Company mill in Haines are sawn as dimensional lumber with 40 percent of the spruce being both sawn to dimension and planed. From start-up in December 1987, the mill in Haines with an annual capacity of 32 MMBF per shift has added a second shift and currently has 97 employees. In February 1989, the Ketchikan Pulp Company will begin operating a new \$12.5 million sawmill adjacent to its pulp facility in Ketchikan. The new sawmill with an annual capacity of 60 MMBF per shift will boost utilization of small logs. Staffing of the mill is expected to require 70 employees when a second shift begins in April 1989. The mill will be geared to cut metric or domestic sizes (Shaub, 1988).

It is also important to recognize the significant investments in forest products production capacity taking place just outside Southeast Alaska. Chugach Forest Products, Inc. will begin operation of a new 70 MMBF computerized sawmill in the spring of 1989 at Seward in Southcentral Alaska (Alaska Department of Commerce and Economic Development, 1988). The mill and operators are being certified to apply Japanese grading standards to their lumber output (Chittick, 1988). Repap Enterprises, Inc., a Montreal-based firm is studying a billion dollar expansion to its pulp and paper complex located in Prince Rupert, British Columbia (Juneau Empire, 1989). These investments represent new competition for producers in the Southeast Alaska region for timber supply and export markets. Perhaps more importantly, the investments reflect the buoyant outlook within the industry on the future for trade in forest products in the Pacific Rim.

*Table 1. Timber supply in southeast and southcentral Alaska
Harvest and import by source and type of timber, fiscal years 1980-1988 ^{1/}*

	1980	1981	1982	1983	1984	1985	1986	1987	1988
(In million board feet, log scale)									
Southeast									
Public									
Tongass N.F.									
Sawtimber	428.3	339.5	326.6	220.0	226.7	162.5	251.4	282.0	331.5
Utility ^{2/}	51.8	47.8	43.8	30.0	34.0	69.5	39.1	54.2	64.7
State of Alaska									
Sawtimber	32.5	38.1	26.2	20.9	14.3	3.3	10.4	16.1	13.5
Utility	0.5	0.7	0.0	0.1	0.5	0.5	0.2	0.3	0.1
BIA	12.8	4.7	2.8	3.1	1.1	0.1	0.0	0.0	0.0
Private^{3/}									
Export Sawlogs	83.0	31.6	137.0	249.3	202.3	225.3	295.9	286.1	286.4
Pulplogs	61.8	35.4	22.3	42.6	56.0	46.6	ne	110.0	121.3
SE AK Sawlog Harvest	556.6	413.9	492.6	493.3	444.4	391.2	557.7	584.0	631.4
SE AK Total Harvest	670.7	497.8	558.7	565.9	534.8	507.8	596.6	748.5	817.5
Imports									
Sawlogs	33.0	27.1	3.1	21.1	5.7	7.8	24.4	5.7	0.1
Pulpwood logs	0.0	0.0	0.0	2.0	38.0	11.9	22.1	5.1	6.8
Wood chips ^{4/}	0.0	0.0	0.0	0.0	15.6	0.0	0.0	0.0	0.0
SE AK Wood Supply	703.7	524.9	561.8	589.0	594.1	527.5	643.1	759.3	824.4
Southcentral									
Public									
Chugach N.F.	1.3	1.8	0.4	1.1	0.5	0.7	0.8	0.7	1.0
State of Alaska									
Sawtimber	12.1	13.2	1.4	0.8	0.8	0.5	1.0	1.1	0.5
Utility	2.4	2.6	0.8	27.8	2.3	1.8	0.8	0.8	1.6
Private									
Export Sawlogs	27.6	18.5	21.2	ne	ne	ne	ne	44.2	79.2
Pulplogs	ne	ne	ne	ne	ne	ne	ne	0	6.4
Southeast and Southcentral Alaska									
Harvest Sawtimber	597.6	447.4	516.6	495.2	445.7	392.4	559.5	630.0	712.1
Harvest Total	714.1	533.9	582.5	595.6	538.4	510.8	599.2	795.3	906.2
Wood Supply	747.1	561.0	585.6	618.7	597.7	530.5	645.7	806.1	913.1

1/ The Federal Fiscal Year extends from October 1st to September 30th of the following year.

2/ The Forest Service requires the harvest and removal of utility volume which is in addition to the 450 MMBF Allowable Sale Quantity (ASQ) calculated in the Tongass Land Management Plan (TLMP). The 450 MMBF Allowable Sale Quantity is based on net sawlog volume, whereas, the timber supply of 4.5 billion board feet per decade specified in Section 705 of the Alaska National Interest Lands Conservation Act (ANILCA) is nonspecific. It is assumed the Section 705 provisions are net of utility volume since the Congressional Record on ANILCA references the ASQ calculations in TLMP.

3/ Estimate. Sources were not found for certain years or ownerships and are not estimated (ne). Some of the private harvest reported in fiscal years 1982-86 for southeast Alaska originated from southcentral Alaska, but data were not available to separate the two regions from the estimated total.

4/ Compiled from official statistics of the U.S. Department of Commerce. Commerce reports pulpwood imports and wood chips imports in short tons. Cords are converted to log scale at a ratio of 2 cords per thousand board feet(MBF). Wood chips are converted to log scale at a ratio of 2.7 short tons per MBF.

TIMBER SUPPLY

The forest products industry in Southeast Alaska has four principal sources of timber: forested lands of the Tongass National Forest administered by the USDA Forest Service; timber inventory held by private corporations (principally Alaska Native Corporations formed through ANCSA); timber sales of the State of Alaska; and imported logs and chips (Table 1). Federal timber is used to make dimension lumber, rough-sawn timbers called cants and pulp. Some of the western redcedar and Alaska cedar harvested on Federally-administered land is sold (under exemption) as logs for export. Timber from private and State land is exported as logs or sold to local pulp mills.

National Forest timber harvest in fiscal year 1988 was up 18 percent from 1987. 331.5 MMBF of sawtimber was harvested from the Tongass National Forest. An additional 64.7 MMBF in utility volume was taken yielding a total harvest of 396.2 MMBF from the Tongass.

Private corporations (Southeast Alaska Native corporations organized under ANCSA) have steadily increased their share of the total Southeast Alaska timber harvest; from 22 percent in fiscal year 1980 to almost 50 percent in fiscal year 1988. During 1987 the sawlog harvest from private lands was approximately 286 MMBF and the pulplog harvest roughly 110 MMBF. The saw timber harvest for fiscal year 1988 is estimated at 286.4 MMBF from private land in Southeast Alaska and 79.2 MMBF from private land in Southcentral Alaska. Pulplog harvest from private land this year is estimated at 121.3 MMBF from Southeast Alaska and 6.4 MMBF from Southcentral Alaska.

Table 1 reports estimated harvest by ownership or management authority for fiscal years 1980-88. Figure 2 show the distribution of harvest by ownership or managing agency for fiscal year 1988.

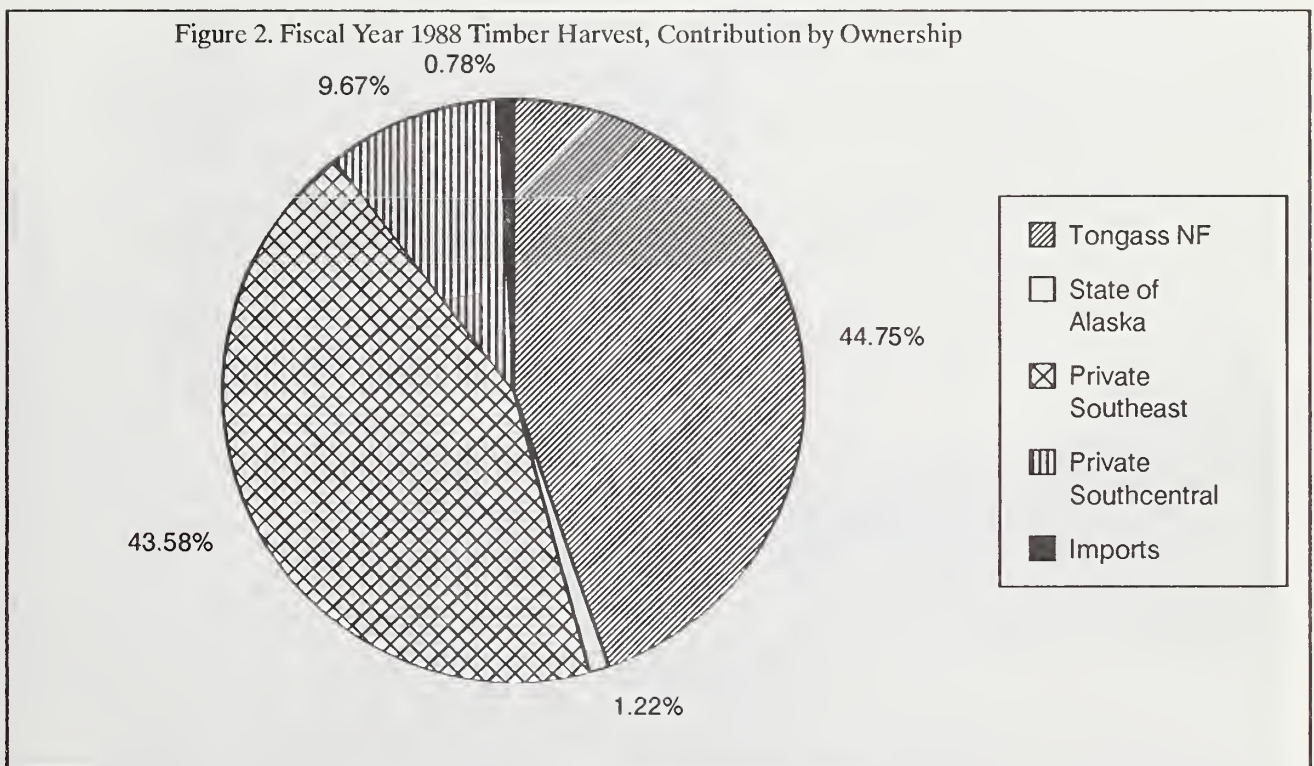
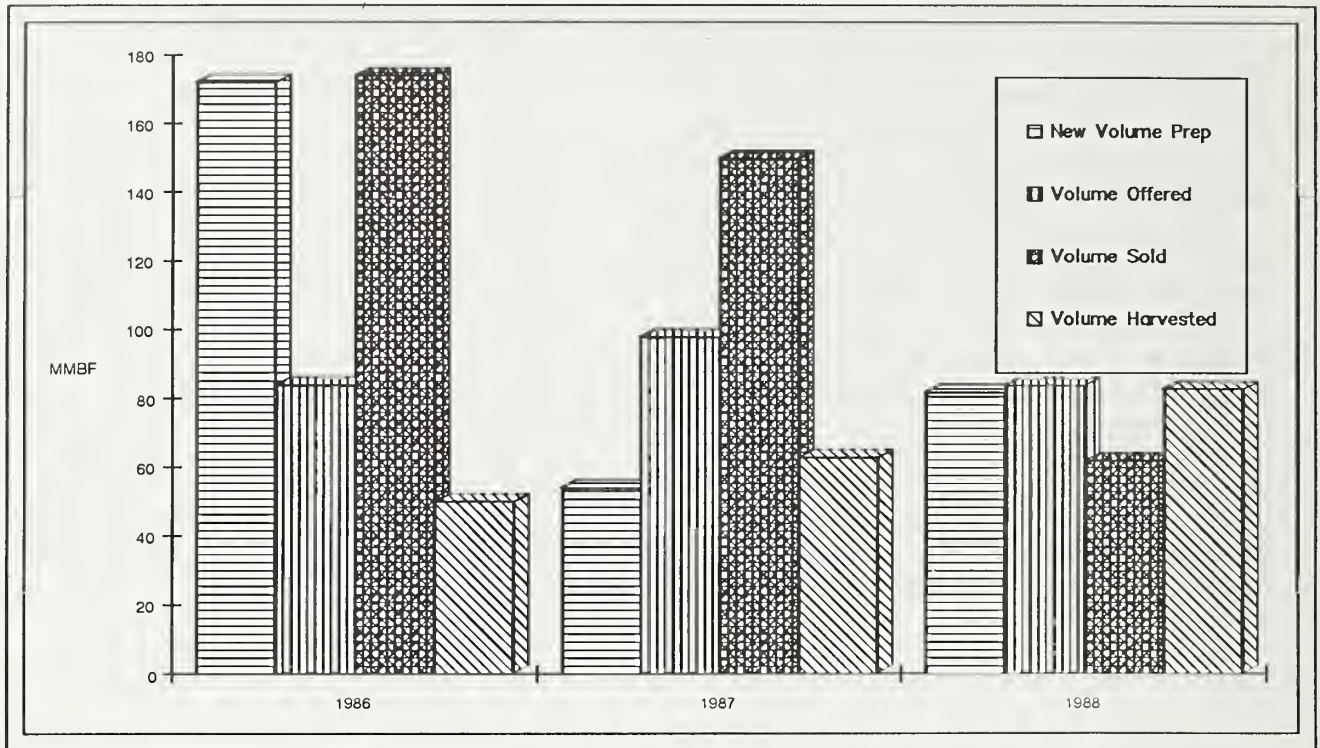


Figure 3. Tongass Timber Volumes Prepared, Offered, Sold and Harvested
Short-term Timber Sales, Fiscal Years 1986-88



Most new road construction is funded by timber sales through purchaser credits.

FOREST SERVICE CONTRIBUTIONS TO TIMBER SUPPLY

Status of Forest Service Timber and Rooding Policies on the Tongass National Forest

The Forest Service adjusts its timber sale offerings and road construction in response to the anticipated demand for forest products from Alaska's trading partners in the Pacific Basin. The objective of the timber sale program on the Tongass is to balance timber supply with the anticipated needs of purchasers, including the construction of public roads and facilities. The balance is never perfect because of the time it takes to prepare timber for harvest. Typically, it requires 3 to 7 years of staff and contractor effort from when a timber sale is initially designed to when harvest begins.

Harvest in fiscal year 1988 increased 18 percent over last year and the volume under contract plus volume remaining in the long-term sale operating plans fell by 18 percent (Table 2). Stronger markets and adjustments in timber sale offerings improved the balance among volume offered, sold/released and harvested in fiscal year 1988 over prior years (Figure 3).

The current policy for future timber sales is to base offerings on harvest levels for the previous year with adjustments for anticipated changes in the market for forest products. Roads are designed and constructed just in time to execute timber harvest.

Some roads are built through public works contracts in advance of timber sales (preroading). On the long-term sales, any roads funded in this manner are constructed where the operators plan to harvest within the

current five-year plan. Rooding on short-term timber sales funded in this way, in most cases, are constructed after they are sold, which can increase the time between the purchase of the timber and when it is actually harvested. In recent years, most of the new road construction has been funded by timber sales through the purchaser credits rather than funded through public works.

Targets for Timber Volume Versus Accomplishments on the Tongass National Forest

An Allowable Sale Quantity (ASQ) of 4.5 billion board feet per decade from the Tongass National Forest was calculated in the Forest Plan. The Forest's ability to supply this volume has been verified, given land status changes, timber harvests to date and the investments in intensive forestry such as precommercial thinning. Since 1980, the average annual volume of timber made available to industry is 450 MMBF per year, of which 400 MMBF per year has been actually sold or released. Tongass timber is considered by the Forest Service available to industry when it has been offered for sale in short-term sales or is released in the long-term timber sales. Although the ANILCA timber supply goal has been met thus far, it is unlikely that an annual average of 450 MMBF will be sold over the period 1980-1989.

Tongass timber was scheduled in the Forest Plan based upon assumptions about the productivity and availability of forest land, investments in the thinning of second growth forests, road access, and the feasibility of

Table 2. Volume of Timber Prepared, Offered, Sold and Harvested on the Tongass National Forest, Fiscal Years 1986-88 (all volumes in MMBF, net sawtimber)

	Short-term Sales	
	1987	1988
New Volume Prepared	54	84
Volume Offered-New	98	82
Volume Sold	150	62
Volume Harvested	63	83
Volume Uncut Under Contract	438	417
Long-term Sales		
	1987	1988
Volume Harvested	219	249
Volume Remaining in Operating Plan	1,068	819

Source: USDA Forest Service, Alaska Region

advanced logging technology. Figure 4 compares the volume classes prescribed for harvest in the Forest Plan to the volume classes of timber made available to industry, sold and harvested between 1980 and 1988.

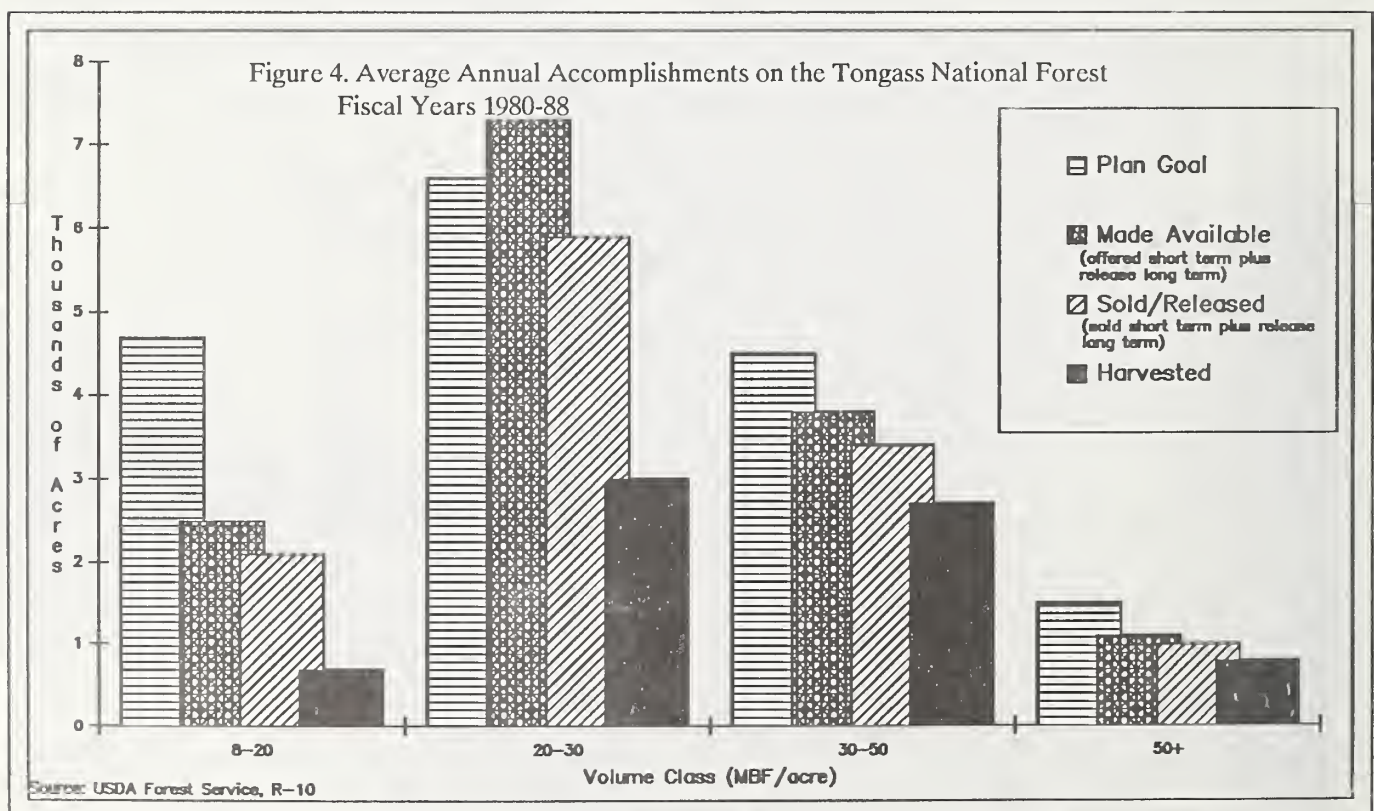
Clearly, timber harvest on Tongass National Forest lands has fallen short of the harvest anticipated in the Forest plan. Still, the planners did well in the face of the macroeconomic and local uncertainties which persisted through the 1976-79 planning period -- high inflation, rising interest rates, energy shortages, and extensive but unknown conveyances of forest land to ANCSA corporations and the State of Alaska. It is important to emphasize that the shortfall in harvest on the Tongass National Forest did not imply that demand for Alaskan forest products diminished. Furthermore, for three reasons, the major policies of the United States government which reduced harvest on the Tongass are not likely to be repeated.

First, the extensive conveyance of public forest land to private corporations (under ANCSA) and the State of Alaska (through the Statehood Act) is not likely to be repeated. These conveyances significantly changed the quantity of timber which could be offered to the marketplace and the restrictions on domestic processing required. Given their desire to protect and promote

employment in the domestic processing of forest products, the Japanese, Chinese, Koreans and Taiwanese have always preferred to import logs rather than import lumber, veneer, plywood, pulp or paper. It is only logical then, when given a choice between logs and manufactured forest products, that these importers favor logs. The market certainly proved the point. Private log exports from Alaska have grown steadily from 1980 with the exception of a pause in the trend in 1984.

While private timber supplies in Southeast Alaska are expected to dwindle as the existing inventory is harvested, considerable private supplies from Southcentral Alaska are anticipated. In combination, the Tongass, State of Alaska and private suppliers may experience continued growth in total harvest, processing and export.

The second major macroeconomic event which dampened demand for Tongass timber was a monetary contraction in the United States which resulted in a rapid rise in real interest rates in the United States between 1979 and 1981. While the monetary restraint was appropriate to combat rising inflation, the resulting divergence between real return on investment in the United States and abroad led to significant appreciation of the United States currency.



The dollar's appreciation between 1981 and 1985 made exports from the United States comparatively more expensive. The more value-added in the United States, the more expensive an import from the United States appeared to the foreign buyer. Logically, foreign buyers tried to minimize import costs by deferring the purchase of goods from the United States where a substitute was available. Where alternative sources could not be found, importers of commodities from the United States sought goods in the least processed form possible. Thus, the rapid appreciation of the dollar shifted demand in Southeast Alaska toward logs and away from the products processed from Tongass timber. It is important to note that even in the depths of the 1983-1985 recession in Alaska, demand for Alaskan timber continued and was met through increased log exports. Because of the dollar's strength abroad, logs from the United States were simply more appealing to foreign buyers than cants or lumber. This tremendous appreciation of the United States dollar against the Japanese yen is not expected again in the near future.

In fact, it is the third major macroeconomic event which has again altered the trading terrain for the Pacific Basin and allowed Tongass timber supply to show its true trading potential. Almost single-handedly, the United States powered the world out from recession in 1981-82, first with deficit spending and then by a consumer-driven expansion which continued through 1986.

The consumer-based expansion in the United States with the tremendous buying power of the appreciated dollar created a deluge of imports from the Pacific Rim. Japan, Taiwan, Korea, Thailand, Malaysia and Singapore all grew at a double digit pace. By the end of 1986, the subsequent trade imbalance left Japan and the newly industrializing nations of the Pacific Rim with huge dollar surpluses.

During the same period, continuous declines in the rate of inflation in the United States no longer warranted high interest rates. While the falling interest rates in the

United States boosted housing starts substantially, it also lowered the return from holding dollars relative to Japanese yen or German marks. International investment flows responded quickly to the signals of the global financial market and the dollar fell rapidly against all the major trading currencies.

Fortunately, growth in exports from the United States has continued the economic expansion enough to enable Japan to experience an economy propelled by consumers as well as by exporters. The yen's appreciation against most currencies and the large reserves of dollars earned during the 1980s have doubled the effective purchasing power of the Japanese consumer. Today, this increase in buying power is directly translating into increased demand for Tongass timber. In short, as private timber in Southeast Alaska is removed, we anticipate that producers will again look to the Tongass to supply a larger share of the timber demand in Southeast Alaska.

Forest Service expenditures in fiscal years 1981-88 and estimated expenditures in fiscal year 1989 on the Tongass Timber Program are shown in Table 3. The expenditures include investments in precommercial thinning, pre-roading, and advanced logging technology that are prescribed in the Forest Plan and included in the ANILCA, Section 705(a) funding provision.

The effects of Tongass National Forest land status changes since 1980 on the timber supply have also been evaluated. Land status changes are discussed on page 6 of the ANILCA Section 706(b) 1987 Status of the Tongass National Forest Report.

The combined effects of volume class distributions, investment levels and land status changes on timber supply indicate that the Tongass can supply the 4.5 billion board feet per decade with the current land base and the funding levels outlined in the Forest Plan and this capability should hold true as State and private land selections are finalized.

Table 3. Investments in timber management for the Tongass National Forest
(Thousands of Dollars)

		1/									2/
		FY1981	FY1982	FY1983	FY1984	FY1985	FY1986	FY1987	FY1988	FY1989	
Research Program:											
Timber Program Research	M\$	150	1,401	1,654	1,674	2,044	2,044	2,413	1,724	1,800	
Timber Program:											
Timber Resource Planning and Inventory	M\$	3,311	4,595	4,283	3,984	5,682	4,661	4,267	5,033	3,548	
Supplemental NEPA Analysis	M\$								(1,238)	(660)	
Timber Sale Preparation	M\$	2,277	3,181	3,113	3,213	2,897	2,529	2,390	1,736	2,217	
Short-term Sales	M\$	(736)	(895)	(1,413)	(1,369)	(1,037)	(654)	(710)	(434)	(844)	
Total Volume	MMBF	(174)	(132)	(212)	(205)	(154)	(97)	(109)	(94)	(115)	
Net Sawlog Volume	MMBF	(151)	(115)	(184)	(178)	(134)	(84)	(98)	(82)	(100)	
Long-term Sales	M\$	(1,541)	(2,286)	(1,700)	(1,844)	(1,860)	(1,875)	(1,680)	(1,302)	(1,373)	
Total Volume	MMBF	(451)	(419)	(316)	(343)	(343)	(343)	(343)	(293)	(242)	
Net Sawlog Volume	MMBF	(394)	(363)	(275)	(298)	(298)	(298)	(298)	(255)	(200)	
Timber Sales Administration	M\$	2,084	2,586	2,576	2,135	2,661	2,328	2,784	2,981	3,520	
Short-term Sales	M\$	(771)	(1,034)	(541)	(470)	(532)	(466)	(600)	(1,181)	(1,188)	
Total Volume	MMBF	(144)	(152)	(53)	(57)	(37)	(58)	(72)	(95)	(138)	
Net Sawlog Volume	MMBF	(125)	(132)	(46)	(50)	(32)	(50)	(63)	(83)	(120)	
Long-term Sales	M\$	(1,313)	(1,552)	(2,035)	(1,665)	(2,129)	(1,862)	(2,184)	(1,800)	(2,332)	
Total Volume	MMBF	(247)	(224)	(200)	(204)	(151)	(231)	(264)	(286)	(302)	
Net Sawlog Volume	MMBF	(215)	(195)	(174)	(177)	(131)	(201)	(219)	(249)	(250)	
Timber Support	M\$	2,350	1,899	1,967	2,113	2,337	2,379	2,367	1,615	1,345	
Total Timber Program	M\$	10,022	12,261	11,939	11,445	13,577	11,897	11,808	11,365	10,630	
Reforestation and Timber Stand Improvement Program											
Reforestation	M\$	359	762	842	684	439	162	89	0	35	
	Aeres	(1,876)	(972)	(2,031)	(1,159)	(365)	(158)	(0)	(0)	(0)	
Timber Stand Improvement	M\$	1,838	3,232	2,395	1,918	2,036	3,070	2,956	53	930	
	Aeres	(6,807)	(6,985)	(9,429)	(7,701)	(8,231)	(8,544)	(8,654)	(0)	(1,060)	
Total Reforestation and Stand Improvement Program	M\$	2,197	3,994	3,237	2,602	2,475	3,232	3,045	53	965	

1/ Enabling legislation (ANILCA) for the Tongass Timber Supply Fund was not enacted until 12/02/80. The fund was not created in Treasury until the third quarter of fiscal year 1981. The dollars shown for the Tongass Timber Supply Fund were supplemented with Protection and Management appropriated dollars to produce the accomplishments reported.

Table 3. Investments in timber management for the Tongass National Forest
(Thousands of Dollars)

		^{1/}								^{2/}
		FY1981	FY1982	FY1983	FY1984	FY1985	FY1986	FY1987	FY1988	FY1989
Construction Program										
Facilities Construction	M\$	1,870	7,344	2,177	3,681	2,282	1,561	1,526	28	0
Roads and Bridges Constructed by PCP										
Construction	M\$	(20,035)	(35,513)	(7,537)	(1,102)	(1,434)	(2,304)	(7,290)	(9,348)	(6,297)
	Miles	(122.4)	(194.8)	(40.9)	(8.6)	(18.0)	(71.5)	(51.1)	(70.7)	(76.0)
Reconstruction	M\$	(110)	(0)	(617)	(1,030)	(190)	(116)	(1,706)	(587)	(548)
	Miles	(59.2)	(0.0)	(19.4)	(22.4)	(29.9)	(6.7)	(22.3)	(29.1)	(24.0)
Subtotal	M\$	(20,145)	(35,513)	(8,154)	(2,132)	(1,624)	(2,420)	(8,996)	(9,935)	(6,845)
Support to PCP										
Admin & Support	M\$	2,544	5,319	2,057	2,009	2,536	2,309	1,808	1,145	1,900
Preconstruction										
Engineering	M\$	1,614	3,376	1,305	1,275	1,610	1,465	1,473	1,200	2,902
Construction										
Engineering	M\$	734	1,534	593	579	732	666	409	714	750
Augmentation	M\$						2,336	3,246	595	900
Subtotal	M\$	4,892	10,229	3,955	3,863	4,878	6,776	6,936	3,654	6,452
Roads and Bridges Constructed by the Forest Service										
Admin & Support	M\$	481	1,227	2,516	2,458	2,161	1,674	1,909	2,139	1,332
Preconstruction										
Engineering	M\$	331	844	1,730	1,690	1,486	1,151	1,319	1,546	1,154
Construction										
Engineering	M\$	190	486	996	973	856	663	893	605	296
Construction	M\$	1,946	6,333	9,929	10,391	9,706	9,504	5,423	7,743	3,162
	Miles	(6.7)	(24.5)	(63.5)	(65.1)	(41.7)	(40.4)	(23.4)	(33.4)	(12.7)
Reconstruction	M\$	1,086	0	0	475	469	2,489	3,161	1,453	868
	Miles	(11.3)	(0.0)	(0.0)	(34.8)	(3.3)	(20.3)	(28.4)	(5.8)	(6.6)
Subtotal	M\$	4,034	8,890	15,171	15,987	14,678	15,481	12,705	13,486	6,812
Log Transfer Site	M\$	0	1,776	596	481	1,302	391	1,368	182	1,470
Total Construction	M\$	10,796	28,239	21,899	24,012	23,140	24,209	22,535	17,322	14,734
Tongass Plan Revision	M\$							102	2,990 ^{3/}	1,755
General Administration	M\$			6,311	8,321	5,212	6,581	6,058	5,513	6,115
TOTAL, Tongass Timber Supply Fund										
	M\$	23,165	45,895	45,040	48,054	46,448	47,963	45,961	38,995	35,999

^{2/} Data reported for fiscal years 1981 through 1988 represent final obligations and final accomplishments. Fiscal year 1989 represent final allocation dollars and targets as shown in the FY 1990 Explanatory Notes.

^{3/} Includes \$1,200 to fund a Geographic Information System.

*Table 3. Investments in timber management for the Tongass National Forest
(Thousands of Dollars)*

		FY1981	FY1982	FY1983	FY1984	FY1985	FY1986	FY1987	FY1988	FY1989
KV ^{4/5/}	M\$	882	944	211	1,013	1,073	1,214	1,080	1,210	2,095
Brush Disposal ^{5/}	M\$	62	0	13	26	40	57	53	43	85
Salvage Sale Fund ^{5/}	M\$	135	328	148	318	165	26	127	35	133

4/ KV funds may be used on sale betterment projects that mitigate or enhance the objectives of other resources such as soil, water, wildlife and fisheries. General administration costs are also assessed KV funds. For the period FY1981 through FY1989, the following amounts have been used for essentially reforestation and TSI:

		FY1981	FY1982	FY1983	FY1984	FY1985	FY1986	FY1987	FY1988	FY1989
Reforestation/TSI	M\$	595	738	69	408	385	373	35	397	335
	Acre	(1,942)	(1,438)	(139)	(1,102)	(854)	(1,299)	(147)	(5,314) ^{6/}	(1,000)

5/ Includes Regional Office.

6/ Includes acres of natural regeneration without site preparation.

ALASKA'S TIMBER MARKET AND FACTORS AFFECTING FUTURE TRADE

In addition to supplying domestic processors, Alaska's forest products industry exports high-quality pulp products which are competitive world-wide. In fiscal year 1988, Alaskan manufacturers exported \$160 million in pulp products to 16 countries in Asia, Europe and Latin America. The major markets for Alaska's output of softwood logs, cants and lumber in fiscal year 1988 were Japan, South Korea, Canada, Taiwan and China. Log exports were valued at \$261 million and lumber shipped abroad in fiscal year 1988 was valued at \$52.1 million (Table 4).

In each product and foreign market, Alaskan manufacturers must compete with softwood producers from the Pacific Northwest, British Columbia, the Soviet

Union, New Zealand and Chile. In a variety of structural and decorative end-uses, Alaskan lumber manufacturers must also compete with hardwood suppliers spread throughout Southeast Asia.

Japan remains the largest importer of softwood products outside North America. In fiscal year 1988, Japan imported 48 percent of the value of Alaskan pulp exports, 81 percent of the value of log exports and 93 percent of the value of lumber exports. The good export market for forest products has tightened supplies sufficiently that Alaskan producers are finding markets for pulp-grade logs in British Columbia (Table 5).

Over the last three years, markets in the Pacific Northwest have been established for Alaskan timber

Table 4 International exports of Alaskan forest products, fiscal years 1980-88^{1/}

Product/Unit	1980	1981	1982	1983	1984	1985	1986	1987	1988
Softwood Logs									
Volume (MMBF)	179.7	130.1	197.5	292.6	237.6	258.6	340.3	436.1	482.2
Value (\$millions)	91.4	68.4	95.4	128.3	97.1	99.6	137.9	179.6	261.6
Unit Value (\$/MBF)	509	526	483	439	408	385	405	412	543
Lumber and Cants									
Volume (MMBF)	266.5	202.5	178.6	136.0	113.3	122.1	93.7	121.1	153.4
Value (\$millions)	96.6	60.3	62.5	45.5	32.2	32.5	24.7	33.9	52.1
Unit Value (\$/MBF)	362	298	350	334	284	266	263	280	340
Woodchips									
Volume (MSTN)	159.0	66.7	93.5	21.0	11.6	4.9	0	0	11.5
Value (\$millions)	10.6	5.5	6.4	1.3	.3	.4	0	0	.6
Unit Value (\$/STN)	66	82	68	60	29	89	0	0	49
Woodpulp									
Volume (MSTN)	325.0	278.8	232.6	207.8	274.7	183.5	224.6	255.7	287.1
Value (\$millions)	158.6	135.7	113.3	94.8	127.3	72.0	85.4	113.9	160.4
Unit Value (\$/STN)	488	487	487	456	463	393	380	446	559
TOTAL VALUE (\$millions)	357.2	269.9	277.6	269.9	256.9	204.5	248.0	327.4	474.7

^{1/}Volumes exported are in millions of board feet (MMBF) or thousands of short tons (MSTN). Values are free along ship (FAS) in millions of nominal dollars. Unit values are dollars per unit.

Source: Compiled from official statistics of the U.S. Department of Commerce (1988).

products. In addition, producers of semi-finished products (such as cants) have shifted some production to surfaced lumber cut to metric dimensions for the Japanese construction markets. Penetration into these

markets characterize the industry's thrust to diversify and produce higher value-added products.

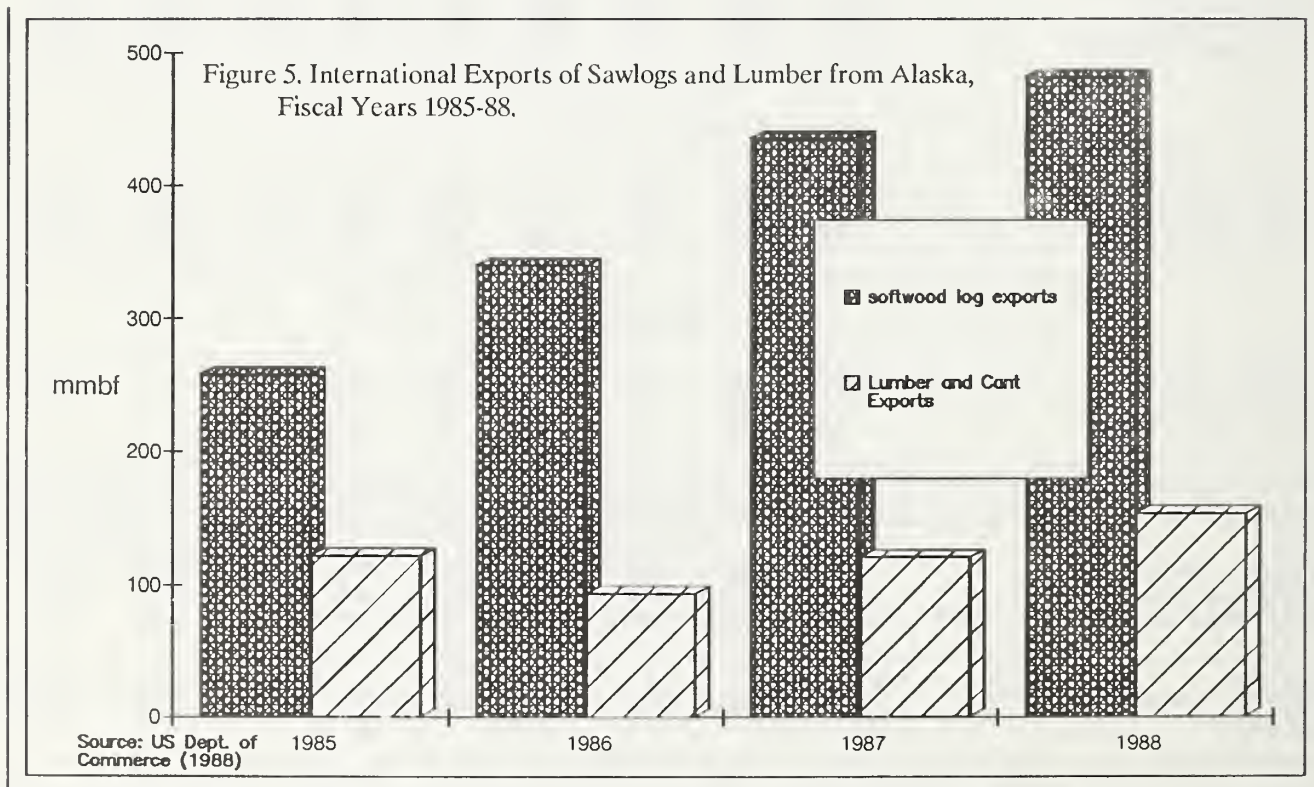


Table 5. Volume and average value of log exports by port, species and destination,
Anchorage Customs District, fiscal year 1988
Volume in thousand board feet, Scribner scale; value in dollars per thousand board feet

Port and Species	Destination *									
	All countries		Japan		Peoples' Republic of China		Korea		Canada	
	Volume	Average Value	Volume	Average Value	Volume	Average Value	Volume	Average Value	Volume	Average Value
Anchorage										
Alaska Cedar	0	-	0	-	0	-	0	-	0	-
Redcedar	0	-	0	-	0	-	0	-	0	-
Hemlock	27002	389.02	14218	475.59	0	0	5066	420.01	5534	116.61
Spruce	56488	390.91	33235	423.40	9660	303.16	10245	390.20	837	116.43
Other softwoods	836	1187.97	836	1187.97	0	-	0	-	0	-
All Softwoods	84326	398.21	48289	452.00	9660	303.16	15311	400.07	6371	116.59
Hardwoods	281	433.81	0	-	0	-	281	433.81	0	-
Dalton Cache										
Alaska Cedar	0	-	0	-	0	-	0	-	0	-
Redcedar	50	497.68	50	497.68	0	-	0	-	0	-
Hemlock	24	327.08	0	-	0	-	24	327.08	0	-
Spruce	96	248.96	0	-	0	-	96	248.96	0	-
Other softwoods	130	913.13	108	1023.06	0	-	22	373.50	0	-
All Softwoods	300	584.47	158	856.80	0	0.00	142	281.46	0	0.00
Juneau										
Alaska Cedar	34	1102.68	0	-	0	-	0	-	0	-
Redcedar	0	-	0	-	0	-	0	-	0	-
Hemlock	13953	480.68	9550	563.00	0	-	4403	302.14	0	-
Spruce	15706	624.83	15706	624.83	0	-	0	-	0	-
Other softwoods	294	1803.65	236	1940.85	0	-	0	-	0	-
All Softwoods	29987	569.86	25492	613.85	0	0.00	4403	302.14	0	0.00
Hardwoods	168	753.64	60	812.23	0	-	89	478.50	0	-
Ketchikan										
Alaska Cedar	0	-	0	-	0	-	0	-	0	-
Redcedar	36726	392.06	12200	435.09	0	-	16419	422.23	7559	250.34
Hemlock	203792	435.97	113935	613.25	1600	150.00	36485	326.70	46647	112.72
Spruce	85981	906.82	76697	997.29	400	150.00	921	371.38	7590	122.09
Other softwoods	15797	885.04	13770	1150.32	0	-	0	-	2027	242.78
All Softwoods	342296	570.26	216602	773.34	2000	150.00	53825	356.60	63823	134.26
Wrangell										
Alaska Cedar	0	-	0	-	0	-	0	-	0	-
Redcedar	16702	496.31	4178	351.95	0	-	12524	544.46	0	-
Hemlock	1740	357.92	1696	358.89	0	-	44	320.32	0	-
Spruce	3074	676.15	3060	678.14	0	-	14	242.79	0	-
Other softwoods	2881	650.55	2502	692.10	0	-	379	376.26	0	-
All Softwoods	24397	527.31	11436	514.68	0	0.00	12961	538.45	0	0.00
Valdez										
Alaska Cedar	0	-	0	-	0	-	0	-	0	-
Redcedar	270	308.52	270	308.52	0	-	0	-	0	-
Hemlock	565	319.00	565	319.00	0	-	0	-	0	-
Spruce	65	1485.00	65	1485.00	0	-	0	-	0	-
Other softwoods	25	1150.00	25	1150.00	0	-	0	-	0	-
All Softwoods	925	420.34	925	420.34	0	0.00	0	0.00	0	0.00
Total										
Alaska Cedar	34	1102.68	0	0.00	0	0.00	0	0.00	0	0.00
Redcedar	53748	424.13	16698	412.43	0	0.00	28943	475.12	7559	250.34
Hemlock	247076	432.54	139964	591.57	1600	150.00	46022	334.61	52181	113.13
Spruce	161410	694.28	128763	796.39	10060	297.07	11276	387.28	8427	121.52
Other softwoods	19963	877.93	17477	1096.41	0	0.00	401	376.11	2027	242.78
All Softwoods	482231	537.69	302902	697.89	11660	276.89	86642	388.60	70194	132.66
Hardwoods	449	553.48	60	812.23	0	0.00	370	444.56	0	0.00

* Destinations other than countries listed include Taiwan and Turkey

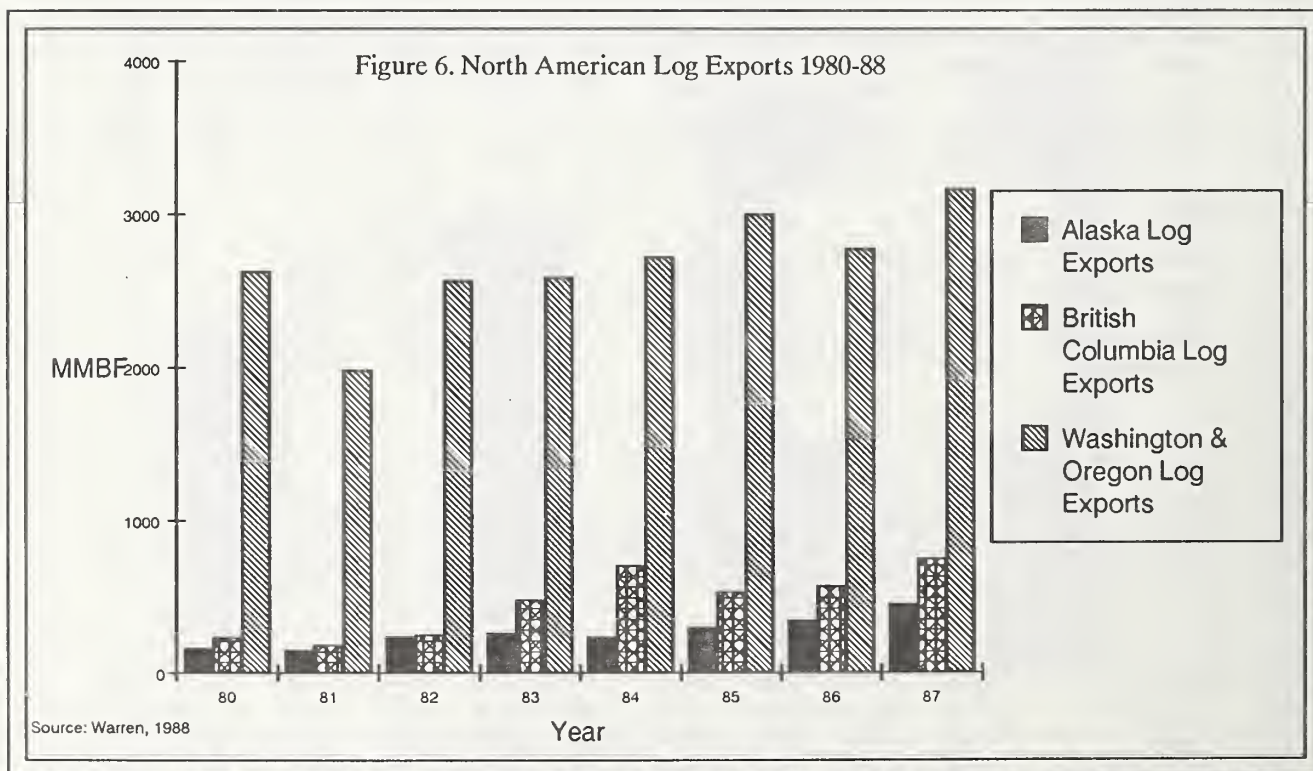
Source: USDA Forest Service, compiled from official statistics of the US Department of Commerce..

Alaska's Log and Lumber Markets

The volume and value of Alaska's log exports increased for the fourth straight year in fiscal year 1988 (Table 6). Compared to fiscal year 1987, log export volume in fiscal year 1988 is up 10.5 percent, value soared 45.6 percent and the average value per thousand board feet (MBF) climbed to a new record for Alaskan exports of \$543 per MBF. Similarly, lumber exports grew for the third straight year (Figure 5). In comparison to the previous year, fiscal year 1988 lumber export volume from Alaska expanded 26.6 percent, total value jumped 53.6 percent with the value per thousand board feet averaging \$340.

This rapid growth in exports stems from the increased competitiveness of the dollar, the continued expansion of the United States and other Pacific Rim economies and constraints elsewhere on softwood supplies of Sitka spruce, tight-grained hemlock and western red cedar. Clearly, the Pacific Rim's importers continue to prefer logs; and softwoods from North America remain popular (see Figure 6). Increased demand for

trans-oceanic containers continues to plague Alaskan producers in their attempt to penetrate Asian lumber markets. Rising freight rates on containers to Asia reflect the success of the United States in selling more products abroad. But, the rising freight rates on containers constrain lumber exporters wishing to sell directly to Pacific Rim wholesalers and end-users. Southeast Alaskan shippers are impacted further because facilities are not available to fill and load trans-Pacific containers. Containers or other forms of protected storage below deck are necessary to ship planed and dried lumber to avoid damage to the product on the Great Circle route to the Far East. Processed lumber from Southeast Alaska destined for containerized shipment to Asia must be barged to Seattle or Anchorage and reloaded into trans-oceanic containers. This additional handling represents a challenge to Southeast Alaskan lumber manufacturers versus coastal producers in British Columbia, Washington and Oregon adjacent to container facilities.



Over the next few years, log exports from Southeast Alaska may decline as a number of private landowners complete their harvest of mature stands. In contrast, private landowners in Southcentral Alaska are projected to more than double their 1988 production of export logs(69 MMBF) to approximately 170 MMBF in 1990 (Figure 7). Lumber production in both Southeast and Southcentral Alaska is expected to grow substantially over the next two years, market permitting(Seymour,1988).

Increased penetration of North American softwood lumber into the Japanese, Taiwanese and Korean markets is expected over the next few years. The extent of the penetration and the division of shares between producers in the United States

and Canada is a function of the macro-economic and trade policies adopted. Shifts in the value of the dollar, successes by North American trade negotiators in reducing tariff and non-tariff barriers and improved marketing by domestic manufacturers almost doubled the value and volume of lumber exports from the United States to Japan between 1983 and 1987 (NFPA, 1988). More gains are likely as North American producers' associations have succeeded in presenting evidence to a number of Japanese jurisdictions that three-story wood-frame housing can be built which minimizes fire hazards when building components are correctly installed and maintained.

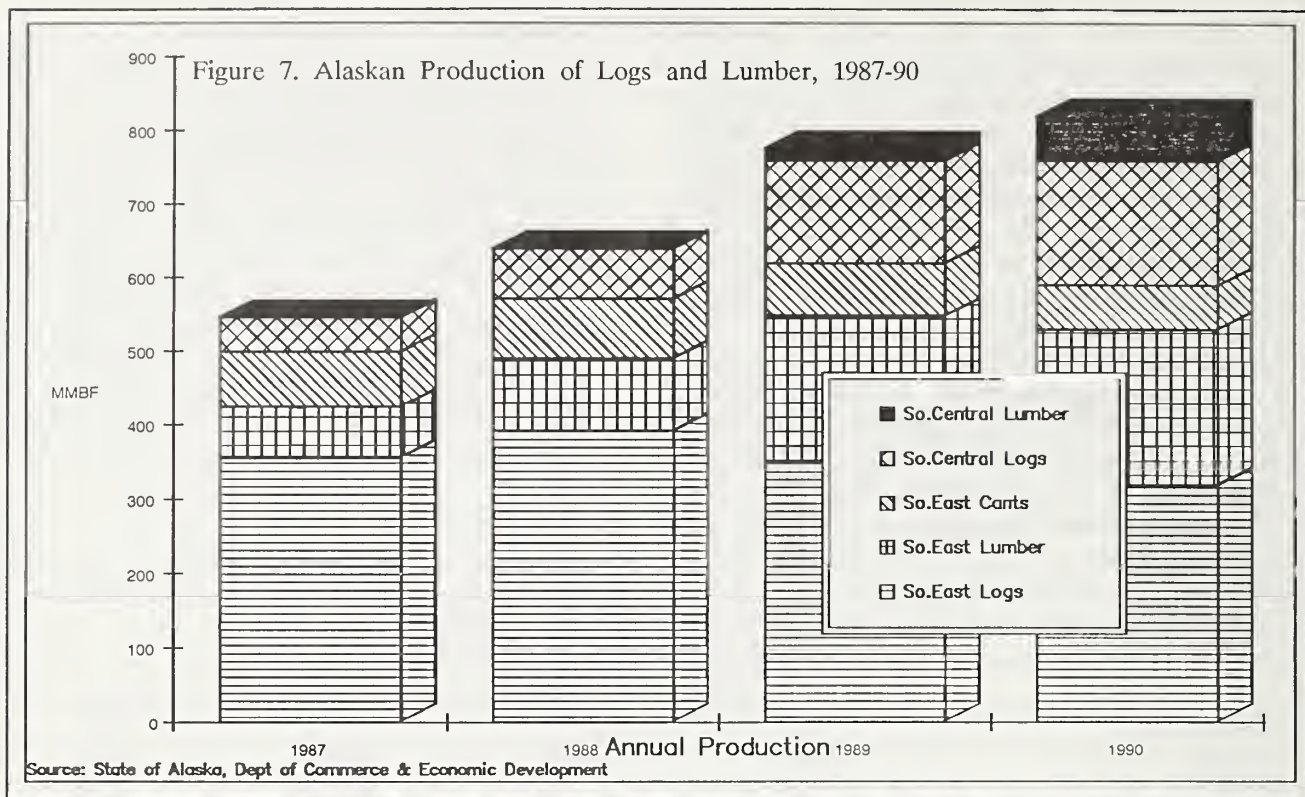
*Table 6. Alaskan Log Exports
Value by Destination by Fiscal Year
(Thousands of dollars)*

Exported to	1985	1986	1987	1988
Canada	1,707	1,564	9,840	9,313
China	745	0	3,775	3,229
Germany, West	0	0	0	17
Israel.	0	0	37	0
Japan	91,415	126,466	148,874	211,393
Korea, South	5,778	9,613	16,595	33,668
Taiwan	0	293	524	3,778
Turkey	0	0	0	246
World	99,646	137,935	179,645	261,643

Note: Compiled from official statistics of the U.S. Department of Commerce.



Japanese, Taiwanese, and Korean markets for North American softwoods are expected to increase over the next few years.



Alaska forest products output is more dependent on international trade than any other softwood producing region in the United States.

Dissolving Pulp -- Alaskan Producers Benefit From a Global Shakeout Which Narrows the Field of Competitors

Between fiscal years 1985 and 1988, the value of pulp exported from Alaska to foreign countries more than doubled jumping from \$72 million to \$160.4 million (Table 7). This increase was much greater than the growth in world demand for pulp which grew 11 percent over the same period (Pulp & Paper, August 87 and August 88). World production of wood pulp by the sulphate and thermo-mechanical processes expanded dramatically to meet exploding world-wide demand for printing and writing papers. Between 1986 and 2000, wood-based pulp produced by chemical processes is expected to expand 43 percent (FAO 1988). In 1987 and 1988, the U.S. pulp and paper industry operated at full capacity. U.S. exports of wood pulp grew from 2.4 million short tons in 1977 to 4.9 million short tons in 1987 (API, 1988). While Alaskan pulp producers manufacture dissolving grades which serve fabric and film manufacturers and not paper producers, they benefit or suffer from any world-wide trend.

In the production of dissolving pulp, the United States maintains a clear positive balance of trade. Over the first ten months of fiscal year 1988 (Oct 87 - July 88), U.S. production was 1.095 million short tons. 672 thousand short tons were exported and imports stood at 88 thousand tons for a net export balance of 584 thousand short tons (Survey of Current Business, 1988). Worthy of note, total exports from the United States of the dissolving grades for fiscal year 1988 were 815 thousand short tons. Alaska exported 287.1 thousand short tons or 35 percent of the gross exports from the United States of dissolving pulp (Schedule B commodity 2500284).

Over the last decade, declining profits forced a number of less efficient producers of dissolving grades to close production facilities or convert them to making paper grades. The profit decline was due to excess capacity which forced market prices for the dissolving grades below sulphite and sulphate paper grades of pulp which are much cheaper to manufacture (Table 8).

World production of dissolving pulp fell from a high in 1978 of 4.87 million metric tons to a low of 4.06 million metric tons in 1982 (FAO, 1988). Since 1982, French,

*Table 7.-- Alaskan Pulp Exports to Foreign Countries
Value by destination by Fiscal Year
(Thousands of Dollars)*

Exported to	1985	1986	1987	1988
Argentina	0	1,326	1,239	1,341
Austria	0	0	103	0
Bangladesh	0	0	795	0
Belgium and Luxembourg	1,004	1,725	2,032	1,198
Bulgaria	0	531	246	0
Canada	958	0	0	354
China	5,099	7,572	14,436	16,842
Czechoslovakia.	0	0	0	47
Egypt	4,850	5,343	3,122	5,621
Germany, West	456	1,610	931	2,171
Hong Kong	0	0	372	0
India	13,368	6,837	18,401	9,043
Indonesia	512	1,290	1,210	1,199
Japan	38,010	42,677	45,340	77,010
Korea, South	180	1,103	1,418	3,282
Netherlands	0	117	112	0
Poland	0	0	1,394	4,294
Soviet Union	0	3,271	4,015	5,247
Spain	920	1,571	0	1,271
Taiwan	5,311	8,180	16,846	28,880
Thailand	513	2,210	1,912	2,597
Venezuela	860	0	0	0
World	72,042	85,366	113,924	160,398

Note: Compiled from official statistics of the U.S. Department of Commerce.

Swedish, Japanese and Russian producers retired unprofitable capacity. The pruning within the dissolving pulp industry and the subsequent global expansion in pulp demand has bolstered the market position of Alaska's pulp manufacturers. Through fiscal year 1988 Alaska's pulp manufacturers operated at full capacity. Rising product prices have them scrambling for new ways to boost production within the existing production lines and adding increments to capacity where it is feasible and financially prudent. While Alaskan pulp producers continue to boost output, competing capacity abroad continues to decline due to better business opportunities in paper pulp production. A major Brazilian firm has told dissolving pulp customers to find other sources of supply because of a company decision to double paper pulp production (Pulp & Paper Week, 1988). Other firms in Europe have announced similar plans. Most observers believe dissolving pulp producers will continue to increase product prices until a differential is established with paper pulp that reflects the higher cost of manufacturing dissolving grades. Historically, this differential has been as much as \$100/ton(ibid). The Alaskan dissolving pulp manufacturers should be successful in lifting prices as long as the demand for paper pulp outstrips capacity.

Demand for Pulpwood in the Pacific Rim is Projected to Increase

The changes in the world pulp market identified above are crucial because they dominate the direction and strength of the pulpwood demand in Alaska and the Tongass National Forest in particular. At the moment, the Pacific Rim fiber market is extremely tight. The appreciation of the yen against most other currencies

makes it cheaper for Japanese builders to buy imported lumber when the product meets domestic specifications. Simultaneously, sources of South Sea logs are narrowing as Indonesia and Peninsular Malaysia tighten their bans on log exports and Phillipine supplies continue to decline. The Indonesians have been very successful in exporting hardwood plywood into the Japanese markets. In combination, these events have lowered Japanese domestic production of sawnwood and plywood. The smaller sawmill and plywood mill throughput yields less waste and fewer chips available for pulp production. The corresponding rapid expansion in North American and Japanese consumption of printing and writing paper has driven up the demand for imported pulpwood, pulp and waste paper (Japan Pulp & Paper, June 1988a). The United States and Australia have provided the largest share of log and chip exports to supply Japan's growing pulpwood demand with additional supplies from Canada, New Zealand, South Africa and the USSR.

Just as growth in the Japanese market is pressuring pulpwood supply around the Pacific Rim, their imports of market pulp is having an equal effect on pulp prices throughout the region. Japanese imports of pulp have risen from 10.9 percent of total consumption in 1976 to 21.9 percent of consumption in 1987 (Japan Pulp & Paper, June 1988b). Since 1986, rapid increases in the world price of selected softwood pulps have made imported softwood pulp more expensive than domestically produced Japanese softwood grades. Still, the domestic Japanese demand for paper has been so strong that domestic capacity is fully committed. 75 percent of the Japanese pulp imports are from North America. Since the balance of Japanese pulp imports are also from

Table 8. Average value per ton of Canadian pulp imported into the United States

Year	Dissolving & Special Alpha	Sulphite Paper Grades	Sulphate Paper Grades	Mechanical
1975	414	357	391	174
1976	427	345	385	168
1977	419	335	367	192
1978	350	320	307	191
1979	392	394	382	241
1980	488	482	471	251
1981	513	508	490	260
1982	524	495	461	251
1983	467	462	403	260
1984	478	464	469	301
1985	399	442	378	283
1986	373	410	388	270

Source: Canadian Pulp & Paper Association. 1988.
1987 Reference Tables. Table 30, p21.

Pacific Rim partners, the demand for wood fiber remains intense.

The Japanese Paper Association is predicting a 5.3 percent increase in paper pulp consumption for their fiscal year 1988 (April 88-March 89). This 5.3 percent increase in consumption will be only partially satisfied by the expected 4.8 percent growth in domestic pulp production. The gap will be filled by imports which are expected to reach 2.7 million metric tons, up 5.4 percent. The 4.8 percent increase in output of Japanese pulp will come wholly from increased imports of pulpwood (Table 9). In an effort to satisfy this demand, the Japanese industry anticipates purchasing fiber supplies from sources as distant as oak chips from the southern part of the US (Japan Pulp & Paper, September 1988). In summary, continued strong demand for pulpwood from the Tongass is expected through fiscal year 1989. As well, opportunities to develop hardwood chip exports from southcentral Alaska seem possible.

Table 9. Japanese pulpwood consumption in 1987 and projection for 1988 (1000 cubic meters)

	1987	1988	%Change
Domestic Pulpwood			
Softwood Logs	1,486	1,530	3.0
Hardwood Logs	236	210	-11.1
Softwood Chips	7,229	7,270	0.1
Hardwood Chips	9,521	9,360	-1.7
Total Domestic	18,472	18,370	-0.6
Imported Pulpwood			
Softwood Logs	13	160	1103.8
Hardwood Logs	60	80	33.3
Softwood Chips	6,398	7,850	22.7
Hardwood Chips	6,968	8,010	15.0
Total Imports	13,939	16,100	15.5
Total Species			
Softwoods		16,785	16,810
Hardwoods	16,785	17,760	5.8
Total Pulpwood Consumption	33,570	34,470	2.7

Sources: 1987 data are from Japan Pulp & Paper vol26:1 p26 and 1988 data are from Japan Pulp & Paper vol26:2 p19

Factors Affecting Alaska's Future Forest Products Trade

Overview

Alaska's trade opportunities are dominated by global macroeconomic conditions. Alaskan forest products output is more dependent on international trade than any other softwood producing region in the United States. Currency shifts and macroeconomic growth policies of the major consuming markets simply overwhelm independent actions by processors in the local marketplace.

Southeast Alaska's comparative advantage in forest products will remain its stocks of mature tight-grained Sitka spruce, hemlock and cedar. Alaska is the principal supplier of Sitka spruce to the Pacific Rim marketplace, accounting for up to 68 percent of the total spruce exports from North America. Alaska's Sitka spruce is generally the highest quality available in the world and the select cuts command premium prices (Wissman et al 1983). Similarly, in good markets, cedar logs and the clear hemlock lumber yield excellent returns in the Japanese market.

In contrast, Alaska's more abundant supplies of lower quality spruce and hemlock must compete with utility volumes of Douglas Fir, Cascade hemlock, Radiata Pine and Southeast Asian hardwoods in packaging and construction end-uses in the Korean, Chinese and Taiwanese markets. For these price-sensitive traders, several species meet end-use specifications; therefore, delivered cost is paramount. As a result, market prices for lower grade logs, cants and lumber fluctuate widely. This price sensitivity affects landowners and managers marketing timber stands which have a high component of low-grade fiber. Potential purchasers have an incentive to lower their bid to cover risk when confronted with the prospect that prices may decline significantly before the first log is taken from the woods.

Exchange Rates

The attractiveness of Alaskan forest products in foreign markets is heavily influenced by the cost of the Alaskan product in local currency vis a vis domestically produced output as well as competitive foreign supplies. Currency shifts have both a price and an income effect. The purchasing power of Japanese consumers has effectively doubled in the last two years. As a result, they not only see the price of Alaskan forest products as cheaper they also regard themselves as considerably richer. The opposite is true for the Chinese and Koreans as their currencies have weakened against the dollar.

A comparison of the buying power of the yen against both the North American dollars helps Japanese im-

porters choose between products from the United States or Canada. Similarly, a comparison between the two North American dollars influences the profitability of Canadian trade with the United States versus trade with Japan or Europe. While fluctuating within a trading range in fiscal year 1988, the United States dollar remained stable compared to the yen while the Canadian dollar has strengthened noticeably against the United States currency and has increased in value relative to the yen (Gruenfeld 1988). This has boosted Alaskan forest products exports to British Columbia. Identically, these currency adjustments have lowered the delivered price of Alaskan lumber and pulp in the Japanese market when compared to a similar product from Canada.

Canadian Exports

Logs, lumber and pulp from British Columbia compete with Alaskan exports throughout the Pacific Rim marketplace. Market forces and trade negotiations between Canada and the United States directly affect the flow of British Columbia's log and lumber exports to the Pacific Rim. When access to the US market shrinks due to economic downturn or trade impediments, the flow of British Columbia's logs to the balance of the Pacific Rim increases. The increased supply of forest products from British Columbia competes directly with Alaskan exports.

Between 1981 and 1987, log exports from British Columbia grew 306 percent from 837 thousand cubic meters to 3.4 million cubic meters (Council of Forest Industries of British Columbia, 1988). Log exports to Japan grew from 595 thousand cubic meters in 1981 to 2.5 million cubic meters in 1987, up 320 percent.

British Columbia has restrictions on log exports which relate to domestic needs, utilization, waste and economic manufacture. In part, the increased log exports reflected the weak markets from 1981-85 which rendered a good deal of timber uneconomic for manufacturing and surplus to domestic needs. Beginning in 1986, the supply of timber qualifying for log export grew with a series of trade actions which imposed an import tariff (later replaced by an export tax) on Canadian lumber exported to the United States. The basis for the actions were charges by producers in the United States that Canada's industry was subsidized by low government fees for stumpage. Subsequent negotiations substituted increased stumpage charges by British Columbia for the tariff/export tax.

Much of the timber designated for export from British Columbia is the smaller, lower quality logs which compete with Alaska's hemlock log and sawn products. This export timber complements British Columbia's well established export market for dimension lumber.

Alaska is indirectly affected by negotiations between the United States and Canada regarding trade in softwood lumber. A Memorandum of Understanding (MOU) on softwood lumber was signed by the two countries in December 1986. It placed a 15-percent export tax on most softwood lumber products exported from Canada to the United States. The MOU provided that replacement measures could be substituted for the export tax. British Columbia developed a package of higher stumpage fees and additional costs to the industry which were substituted for the export tax effective December 1, 1987. These replacement measures increase the costs for all forest industries in the Province, including softwood lumber and logs and wood pulp. The replacement measures thus work against the competitive position of British Columbia's producers in Pacific Rim markets. The Free Trade Agreement between the two countries was implemented as of January 1, 1989. It has language which exempts the MOU from the terms of the Agreement: A 15-percent export tax or its equivalent will continue unless otherwise negotiated by the two countries.

"A dramatic downturn in the volume of log exports from British Columbia is expected following the provincial government's decision to increase the fee collected on the export of non-manufactured forest products. The fee rise, which was announced in late March, will collect 100 percent of the value gained from exporting logs over the domestic selling price. Thus, at least in theory, any financial gain that could be realized from exporting is eliminated. Previously, the fee was 40 percent of the difference (Pacific Rim Wood Market Report, 1989)."

Collectively, these changes lower the cost advantage enjoyed by producers in British Columbia and may affect their share of the market in the Pacific Rim and the United States.

It is important to note that log exports are largely incidental to total forest output in British Columbia. In 1987, log exports constituted only 3.7 percent of British Columbia's harvest of 90.6 million cubic meters.

Wood Fiber Competition from Chile, New Zealand and Australia

Chile exports logs, chips, pulp and newsprint based on extensive plantations of radiata pine. The radiata pine products compete effectively with Alaska's construction grade timber in China, Taiwan and South Korea. Chile plans to develop more domestic processing capacity to complement a well-established marketing program aimed at Pacific and Atlantic markets. Between 1977 and 1987, Chile boosted output of sawnwood by 49 percent, woodpulp by 55 percent and newsprint by 45 percent. Chile's extensive system of plantations were established

under Forestry Public Law 701. This law established in 1973 and due to expire in 1994 subsidizes 75 percent of planting and establishment costs. Approximately 60,000 hectares per year of radiata have been planted under the program. Today, Chile has roughly 1.5 million hectares in radiata plantations. The Chilean Forestry Institute projects that by 1995 the industry will have a sustainable harvest of 21-29 million cubic meters per year. This compares with the 1987 Chilean harvest of 11.6 million cubic meters (Cortes, 1988). While analysts question whether these plans can be implemented in light of Chile's debt and economic-political climate (Flora 1986), the Chileans have demonstrated their ability to succeed in target markets, e.g. growth in log exports from 147.6 thousand cubic meters in 1977 to 1.95 million cubic meters in 1987.

Domestic consumption of softwood logs previously accounted for a large portion of Chile's total softwood log production. However, future domestic demand is not expected to expand at the same pace as the domestic supply of softwood logs. Therefore, future increases in softwood log production are destined to be increasingly dependent on the export market. Chilean softwood log exports are projected to increase by 20 percent in 1989 over their 1988 export level of 1.5 million cubic meters (USDA, 1988). In 1989, softwood lumber exports from Chile are projected to increase by 300 thousand cubic meters over their 1988 foreign sales of 1.6 million cubic meters (ibid). Roughly a quarter of Chile's foreign lumber sales are to Japan. The balance of its lumber exports are to Europe and the Middle East.

Like Chile, New Zealand's solid wood exports compete with Alaskan forest products in the packaging, dunnage and construction end-uses in Japan, Taiwan, China and South Korea. New Zealand's forest products exports have remained level or declined since 1983. The government of New Zealand has announced that the nation's public sector plantations will be auctioned to the private sector in the coming year. It is unclear how this privatization will affect future exports and the level of processing which will be undertaken.

Over the last twenty years, progress in the management of eucalyptus stands for pulp manufacture has revolutionized the pulp and paper business. While much of the stand development and research was conducted elsewhere, Australia (home of the genus) is benefiting from the tremendous increase in demand for chips and pulp from the species. The rise in pulp and chip prices experienced throughout the Pacific Rim over the last three years will foster more plantation development and increase the supply of Australian eucalypt and radiata pine fiber. The key impact on Alaska will depend on the form in which new development takes place. If the In-

doneseans continue to out-compete the Japanese plywood industry as they have done over the last five years, then the supply of hardwood residues in Japan will continue to shrink. If Australia, Chile and New Zealand respond only with increased chip flows then Japan's domestic pulp industry will remain robust and continue to contribute to the by-product demand for logs and cants from Alaska. If Australia, Chile and New Zealand increase pulp production and chip flows to Japan decline with the availability of South Sea logs, then Japan's domestic pulp industry will weaken. Declines in Japan's domestic production of pulp lead to an increase in demand for dissolving pulp and dimension lumber from Alaska and a decline in the demand for Alaskan logs and cants.

Soviet (USSR) Exports to the Pacific Rim

The Soviet Union remains the world's second largest producer of industrial roundwood and third largest exporter (FAO, 1988). Despite its enormous production capacity, domestic consumption and trade with the Eastern bloc absorbs most of the Soviet output. News of a large volume of Soviet barter trade with the Chinese has been discussed but not documented.

Japanese consumption of Soviet logs has remained steady or declined somewhat. Soviet log exports to Japan in 1987 were 6.125 million cubic meters whereas the USA provided 9.702 cubic meters (Japan Lumber Journal, 1988). Soviet lumber exports to Japan have climbed somewhat over the last five years but remain below 200,000 cubic meters (Nippon Mokuzai Bichiku Kiko, 1988). US exports were ten times larger at 2.4 million cubic meters (Japan Lumber Journal, ibid.)

Japanese Demand Increases

Exports of Alaskan forest products to Japan have expanded from \$161.2 million in fiscal year 1985 to \$336.8 million in fiscal year 1988. This is a total increase of 109 percent or an annual average growth of 36 percent. The value of log, lumber and pulp exports to Japan have more than doubled.

Japan, the major consumer of pulp and solid wood exports from Alaska, is projected to continue economic expansion after a pause in 1989 with a 3.0 percent increase in inflation-adjusted GNP in 1990, 3.5 percent in 1991 and a 3.5 percent increase in 1992 (Widman Management, Ltd. 1988). Rapidly rising real income in the country is having both a demand and supply effect. Obviously, on the demand side, increased disposable and discretionary income have balloned the consumption of all forms of non-durable paper and packaging, furniture and decorative end-uses of wood as well as expansion in housing services. Less transparent, is the supply-side effect. Rising incomes are also expected to expand the

demand for amenity services of the country's national forests. In addition, a critical need to maintain erosive soils and protect watersheds is expected to constrain Japan's ability to expand its domestic wood supply.

Rayon, a significant end-use of Alaska's dissolving pulp, has experienced a major resurgence in the world's fashion industry. Much of the expansion in demand has been powered by a rayon cloth called challis. Most challis is made from high-wet-modulus rayon. Analysts estimate that between 130 and 150 million square yards of challis fabric were used in the US in 1986. Japan supplied approximately 50 million square yards or about one-third of the total consumed. Roughly 95 percent of the rayon exported from Japan to the United States is made by the high-wet-modulus method. This production technique significantly lengthens the molecular chain length yielding a fabric which does not elongate much when wet thus overcoming a traditional fault of conventionally-produced rayon cloth (Chemical Business, 1987).

Residential construction in Japan, especially wood-based housing starts, has a strong influence on the demand for solid wood exports from Alaska. Expressed in square meters of floor space, Japanese housing starts increased in both 1986 and 1987. Total starts in 1987 were at the highest level since 1973, and were up 22 percent over 1986 levels. Wood and non-wood based housing starts in 1987 were up 17 and 28 percent, respectively, over 1986 levels.

Continued economic growth throughout the Pacific Rim and a rise in the value of yen against the U.S. dollar have stimulated purchases from U.S. suppliers by Japanese builders. Since 1985, exports of logs, lumber, and pulp to Japan from Southeast Alaska have all increased. For 1986, the value of Alaska's forest products exports to Japan were up 20 percent from 1985. In 1987, they were up an additional 5 percent over the 1986 level. Forest products exports in 1986 represented about 20 percent of all Alaskan exports in terms of dollar value.

Over the last few years, the government of Japan has initiated policies to stimulate domestic consumption. These policies are designed to increase investment spending through tax incentives and labor reforms, which, in turn, will foster more consumer spending and create more leisure time. Several of the tax incentives are specifically aimed at the housing sector. In short, Japan will remain the principal market for North American timber exports, especially for the highly-valued tight-grained spruce, hemlock and cedar.

Timber Demand in China(PRC) Fluctuates Widely

The Chinese trade is a variable component of the North American-Pacific Rim timber exchange. In 1987, the People's Republic of China (PRC) purchases of logs

from the Pacific Northwest and Canada declined by eight percent from 1986. In contrast, exports of softwood logs from the United States to China over the first nine months of 1988 increased 113 percent, to just under a billion board feet(USDA FAS, 1988). Alaska's log exports to the PRC in fiscal year 1988 (11.6 MMBF) paralleled its trade in fiscal year 1987 (11.9 MMBF).

South Korea Timber Demand

South Korea represents expanded trade opportunities for Southeast Alaska and remains an important outlet for construction grade timber. In fiscal year 1988, South Korea imported 86.6 MMBF of Alaskan softwood logs and 370 MBF of hardwood logs. South Korea's acceptances represented 18 percent of Alaska's softwood log exports and 82 percent of its hardwood log exports. The value and species composition of the Korean-bound log exports are shown in Table 5. Most impressive is the growth in the value of log exports to Korea over the last three years with a jump from \$5.8 million in fiscal year 1985 to \$33.7 million in fiscal year 1988 (Table 6).

Alaskan lumber shipments to Korea have fluctuated dramatically over the last decade. After exports at the 4 MMBF level in fiscal years 1980, 1982 and 1983, shipments dropped to zero in fiscal years 1984-85. After only slight penetration of the Korean market in fiscal years 1986 & 1987, Alaskan lumber producers resumed shipments at their historic level of 4.5 MMBF in fiscal year 1988.

Almost as spectacular as the boost in log exports to Korea has been the resurgence of Korean demand for Alaskan pulp. The value of pulp shipments to Korea from Alaska in fiscal year 1985 was a mere \$180,000. In this last fiscal year, Alaska exported pulp valued at \$3.8 million to Korean ports (Table 7).

Taiwanese Demand

Forest products were the seventh largest commodity group exported by Taiwan in 1987. Forest products exports were valued at \$2.2 billion or 4.2 percent of the country's exports (Jen, 1988). With very little natural forest and government prohibition of logging in the nation's forest, Taiwan's extensive forest products industry relies completely on imported raw materials. Taiwan's solid wood converters mostly process hardwood logs and cants into lumber, plywood and furniture for export to the United States and Japan. The nation's pulp and paper manufacturers produce mainly cultural papers for domestic consumption and packaging materials to support exports.

Alaskan forest products exports to Taiwan have grown from \$5 million in fiscal year 1985 to \$32.7 million in fiscal year 1988 with the greatest expansion in the value

tween 1983 and 1987 has grown substantially (Jen, 1988). By major product category, the survey reported the following increase in import value between 1983 and 1987: 1) The value softwood log imports from the United States increased from \$500,000 to \$1.84 million in 1987; 2) import of hardwood logs increased by 100% from \$8.42 million to \$16.9 million; 3) softwood cants jumped 138% from \$600,000 to \$1.46 million; 4) hardwood cants increased from \$2.2 million to \$8.4 million; 5) softwood lumber bolted ahead from \$4.6 million to \$24.2 million; and finally, 6) hardwood lumber jumped from \$25.2 million to \$92 million in 1987.

In total value, the United States has captured only 16% of Taiwanese timber imports in 1987. US share of Taiwanese imports in 1987 by timber product was: hardwood logs - 3.7%; hardwood cants - 29.7%; hardwood lumber - 32.7%; softwood logs - 51%; softwood cants - 38%; and softwood lumber - 37.2%.

There are clear opportunities for hardwood producers of Southcentral Alaska to market hardwood logs and chips to Taiwan. Less certain are the chances for increased exports of softwood logs or lumber from Southeast Alaska into Taiwan. Most of the softwood processed in Taiwan is used in construction and packaging. Until 1988, the Taiwanese have met their needs for softwoods from the indigenous forest. The highest quality logs and lumber were exported to Japan with the falldown used to meet domestic needs. Since the Taiwan government has banned logging in mid-1988, all future softwood requirements must be met through imports. Alternative supplies of radiata, hemlock and larch are likely to beat Alaskan suppliers in the very price sensitive Taiwan market for construction and packaging uses. Alaska's comparative advantage in trade with Taiwan will be in small shipments of red and yellow cedar. Since the Taiwanese solid wood products industry consists mostly of very small operators, each has specialized in converting select species. Principally, Taiwanese cedar converters cut to meet the Japanese market. With domestic supplies no longer available, these cedar converters could learn to process Alaskan supplies if the appropriate industry-to-industry communications are established. Since these converters have always relied on domestic supplies, they have limited experience in international trade or use of Pacific Coast cedar. Increased market penetration by Alaskan cedar suppliers will require US investment in disseminating information on product availability, suppliers, financing and containerized shipment.

Projected Demand For Tongass Timber

Sawlog harvest on the Tongass National Harvest is projected to increase. By fiscal year 1992, sawlog harvest is expected to exceed 400 MMBF.

This harvest pattern is projected on three major assumptions. First, the United States will introduce both fiscal and monetary measures to correct deficits in its federal budget and external trade. Second, these corrective actions will be successful and cause only a moderate contraction in the growth in domestic spending in the United States by mid to late 1989. Third, Japan and other Pacific Rim trading partners will successfully navigate the subtle contraction in US demand by substituting new policies for growth based on consumption for old policies which relied on exports for growth. The assumed outcome is positive growth in the Pacific Rim economies through the 1990s leading to rising demand for wood-fiber products based on rising real incomes.

Alaska Timber Market Studies and Other Research Funded by Congress to Understand the Supply and Demand for Tongass Timber

While there is an extensive body of research dealing with demand for forest products by the Pacific Rim nations, information on the demand for products which can be produced specifically from Southeast Alaska is lacking. Most studies of trans-oceanic trade in forest



Alaskan forest products exports to Taiwan have grown from \$5 million in FY 1985 to \$32.7 million in FY 1988.

products address large supply and demand regions therefore most past studies have incorporated Alaskan exports into the Pacific Northwest which includes British Columbia, Washington and Oregon. Alaskan exports, industry, forest inventory and regenerative capacity are not distinguished.

To better manage the resources of the Tongass National Forest, the Forest Service initiated, in fiscal year 1987, a series of studies to provide new information on the role of Alaskan forest products in the Pacific Rim marketplace. Nine research objectives were identified and a number of studies launched. These studies are complementary to work completed by the Forest Service and the University of Alaska in past years. Also listed in the fiscal year 1987 Status of the Tongass report, the nine objectives are:

1. Define the end use markets for solid wood products (both softwood and hardwood) in Japan, Korea, Taiwan, and China. Initially these end use markets will include new housing, upkeep and repair, non-residential construction, manufacturing, shipping, and other. The information helps assess available forest product technologies in Alaska and their relation to anticipated demands.

2. Develop a basis for making consumption/demand projections in the near-term (up to the year 2000) and in the long-term (beyond 2000). For example, what is the basis for projecting wood use in housing in Japan? This allows for the assessment of the validity of the demand assumptions in the Forest Plan.

3. Develop near- and long-term predictions of demand for products in each country to determine if there is more demand than supply for specific products. This allows the assessment of whether forest products from Alaska can fit the specific demands of the Pacific Rim countries.

4. Develop near- and long-term timber supply potentials for Alaska Native corporations. The results will update the information provided Congress during the debates on Alaska lands about the capability of the Native corporations to sustain timber harvest activities. Timber supply prospects for Native lands directly affect the outlook for demands for timber from the Tongass.

5. Provide an analysis of government policies for each of the four significant Pacific Rim countries with respect to forest products trade and/or resources. Governmental policies can determine whether Alaska's forest products will be able to compete for trade in the Pacific Rim countries.

6. Develop a means to analyze and project transportation and port charges. These charges can have a significant impact on the price of Alaska's exports and can

determine whether Alaska's forests products can compete in Pacific Rim countries.

7. Assess the near- and long-term outlook for quality grade forest products. There is a significant difference in price paid and willingness to purchase forest products based on both species and grade that Alaska can export. This study will help determine the likely future for Alaska's forest products as species and grade mixes change over time.

8. Develop an explanation of domestic pulp production by country and assess the opportunity in the Pacific Rim for market pulp. This allows an assessment of the overall supply of pulp to the Pacific Rim nations and the implications for demand for pulp from Alaska.

9. Determine the factors that relate to the preferences for logs versus cants for each country. At the present time there is a preference for logs. This research is to verify economic assumptions currently used to explain the preference.

Overall leadership and coordination of the study effort is provided by the Pacific Northwest Research Station. The leadership of particular studies under these specific objectives is provided by a mix of Forest Service scientists and cooperating scientists in colleges and universities. To date, specific studies have been awarded to the University of Alaska's Center for International Business, the University of Washington's Center for International Trade in Forest Products, the University of Alaska's Institute of Social and Economic Research, Virginia Polytechnical Institute, private contractors and to Forest Service scientists. Scientists from other universities and Forest Service also are involved in specific studies. Work is progressing on all studies which are scheduled for completion in fiscal year 1989.

Because of the importance of the timber demand studies to the revision of the Forest Plan and the Congressional review of the timber program on the Tongass, the Forest Service established a steering committee to oversee the conduct of a family of these studies called the Alaska Timber Market Studies. The steering committee is chaired by the Dean of the Yale University, School of Forestry and Environmental Studies. The Steering Committee is composed of representatives from the State of Alaska, Sealaska Native corporation, The Wilderness Society, and the National Forest Products Association.

The steering committee met three times. It reviewed the objectives of the studies, evaluated the study plans submitted by the research scientists and monitored the progress through to completion. At its last meeting in June, 1989, the committee agreed to a schedule for making its final recommendations to the Director of the Pacific Northwest Research Station on the preliminary conclusions of the studies.

Outside of the Alaska Timber Market family of studies, two other research efforts have been initiated. A private contractor has completed research estimating demand equations for Tongass stumpage based on an econometric analysis of Japanese demand for logs, lumber and dissolving pulp. The contractor's specific assignment was to prepare economic data to support the forest planning model (FORPLAN) used by the Forest Planning interdisciplinary team in preparing the draft plan. This contractor's input was necessary far in advance of the more comprehensive effort undertaken to analyze demand and competing supply in the Alaska Timber Market Studies.

A further research effort was launched, in fiscal year 1989, to look closer at the demand for dissolving pulp from Alaska. The market pulp studies conducted through the University of Washington Center for International Trade in Forest Products concentrated on market pulp as a substitute for dissolving pulp. Since the studies were initiated, a significant quantity of dissolving pulp capacity has been retired outside of Alaska. As well, the consumption of dissolving pulp has increased. Potentially,

this has changed the outlook for Alaskan pulp manufacturers. The study conducted by Forest Service under the leadership of the Pacific Northwest Research Station and the Forest Products Laboratory of the USDA Forest Service meets four study objectives:

1. Inventory recent changes in world capacity to produce dissolving pulp.
2. Gauge movements in the demand for dissolving pulp -- which uses are growing and which are falling from favor.
3. Clarify the market position of Alaska's dissolving pulp producers relative to competitors elsewhere. What factors will encourage their survival and prosperity versus economic or resource conditions which will detract.
4. Develop a simple economic model which relates dissolving pulp price and capacities to the price of a paper grade pulp which is widely traded in great volume. Use this model as guidance in making near-term forecasts of pulpwood demand for the annual Timber Supply and Demand report which the Forest Service submits to Congress in compliance with ANILCA Section 706(a).



The competitive United States dollar and stable domestic economic growth has increased the demand for timber from the Tongass National Forest over the past two years.



Timber harvests on the Tongass National Forest provided 3,385 jobs to Southeast Alaskans in 1988.

WOOD PRODUCTS EMPLOYMENT IN SOUTHEAST ALASKA

The Tongass Timber program is part of a long-term cooperative effort with the State of Alaska and local government to provide greater economic diversity in Southeast Alaska and more year-long employment. The Forest Service established requirements to process National Forest timber in Alaska, including the construction and operation of pulpmills via long-term, 50-year timber sale contracts. Maintaining timber supply opportunities for the Southeast Alaska timber industry was a major objective of the Tongass Land Management Plan and the Alaska National Interest Lands Conservation Act. To a large extent the employment objective was met in fiscal year 1988 -- logging, sawmill, and pulpmill employment in Southeast Alaska is now 13 percent greater than it was in fiscal year 1980 (Table 10).

Clearly, a constant supply of Tongass timber alone cannot assure the maintenance of ANILCA's timber employment objectives. Other controlling factors include exchange rates, the overall Pacific Rim demand for wood fiber and the competitiveness of timber suppliers outside the Tongass National Forest. But, it is certain that with a more internationally competitive US dollar and stable domestic economic growth, the demand for timber from the Tongass National Forest and other ownerships in Southeast Alaska has increased over the past two fiscal years. It is equally clear that Alaskan producers of wood products can survive, prosper and create new jobs in a positive macroeconomic environment which promotes

exports from the United States. The Alaska Department of Labor has noted the success of Alaska's manufacturing sectors, and especially the wood products industry, to continue competing abroad and expanding employment.

"During the good market years of 1986 and 1987, the timber industry posted double digit percentage employment gains. This is strong growth under any circumstances, but especially considering the poor performance of the economy as a whole. In 1986, seafood processing was the only other industry to register any employment gains. Outside of the manufacturing sector, no other major industry groupings posted employment gains during 1986 or 1987. Without the strength of the manufacturing industry, the state's most recent recession would have been even worse."(Rae, 1988)

Table 11 shows the total receipts for Tongass timber and the payments to the State of Alaska. With few exceptions, 25 percent of all monies received (including purchaser road credits) from the Chugach and Tongass National Forests is paid to the State of Alaska to benefit public schools and public roads in areas where the Forests are located. Finally, Table 12 shows Tongass receipts by category, timber, purchaser road credits, Knutson-Vandenberg collections, etc.

Table 10. Southeast Alaska lumber and wood products industry employment, harvest volume and population, fiscal years 1980-88.

EMPLOYMENT ^{1/}	1980	1981	1982	1983	1984	1985	1986	1987	1988
Logging	1141	1047	991	1010	946	1004	1239	1545	1987
Sawmills	785	605	540	429	395	363	331	375	467
Pulpmills	1023	1081	975	854	700	580	772	861	880
Total Direct Employment	2949	2733	2506	2293	2041	1947	2342	2781	3334
Indirect and Induced ² Employment	2300	2125	1950	1800	1600	1500	1825	1950	2350
TOTAL ^{3/}	5249	4858	4456	4093	3641	3447	4167	4731	5684
HARVEST VOLUME ^{4/} (MMBF)	670.7	497.8	558.7	565.9	534.8	507.8	596.6	748.5	817.5
POPULATION ^{5/} (000's)	55.7	57.7	59.5	62.2	63.5	64.7	64.9	64.2	64.1

1/ Alaska Department of Labor statistics subject to revision. Current as of July 21, 1989.

2/ Rounded to the nearest 25 jobs. Data reflect the impact of money re-circulating through the economy and are estimated from a Forest Service input-output simulation model, IPASS, for southeast Alaska. The IPASS model was developed by the Pacific Northwest Forest and Range Experiment Station in cooperation with the University of Minnesota. Revisions from prior 706(a) reports reflect an updated data base and calibrations to fiscal year 1988 using employment and earnings estimates made by the Alaska Department of Labor. The Forest Service has contracted with the Alaska Department of Labor to provide detailed estimates of earnings and employment by economic sector for Southeast Alaska by fiscal year. This cooperation will improve estimation of the indirect and induced earnings and employment effects of the agency's management initiatives and investments. Revisions of the estimated indirect and induced effects displayed in this table are possible as a result of this joint study.

3/ In fiscal year 1988, the Tongass National Forest supported 2031 of the reported logging, sawmill and pulpmill jobs. Across all economic sectors including forest products, 3385 jobs in southeast Alaska are affected by timber harvest on the Tongass.

4/ Southeast Alaska. This is the total of the following table 1 categories: Sawtimber plus utility for Forest Service and State of Alaska; BIA volume; Export logs and pulp logs for private firms in the southeast Alaska for fiscal years 1983-86 overstate the total harvest by the volume of export sawlogs shipped from southcentral Alaska. Data were not yet found to specify this flow.

5/ Alaska Department of Labor, News Release (no. 90-03) "Population Estimates for Alaska and Components of Change by Census Area, 1980-1988", released July 10, 1989.

Source: Alaska Department of Labor and USDA-Forest Service, Alaska Region.

Table 11. Tongass National Forest receipts^{1/} and payments to the State of Alaska in fiscal years 1980-88.

Fiscal Year	Tongass Receipts		Payments to State	
1980	\$	26,024,494.20	\$	6,506,123.55
1981	\$	15,007,943.86	\$	3,751,985.96
1982	\$	21,622,763.95	\$	5,405,690.98
1983	\$	5,365,915.40	\$	1,341,478.87
1984	\$	4,063,188.62	\$	1,015,797.16
1985	\$	209,231.13	\$	52,307.80
1986	\$	1,967,239.51	\$	491,809.88
1987 ^{2/}	\$	-2,033,575.16	\$	--
1988	\$	1,232,671.72	\$	308,167.93
Total	\$	73,459,873.23 ^{3/}	\$	18,873,362.13

1/ In-place capital investments such as permanent roads, bridges, log transfer facilities and timber stand improvements also contribute to the total assets of the Tongass National Forest, reduce future management costs and are scheduled to achieve TLMP management objectives.

2/ Tongass receipts for fiscal year 1987 were negative as a result of Comptroller General Decision B-224730 of March 31, 1987. The deficit balance is the result of implementing the retroactive emergency rate redeterminations authorized for short-term sales under the provisions of section 4 of the Federal Timber Contract Payment Modification Act of 1984 (P.L. 98-478). The total effects of this provision on Tongass receipts was a reduction of \$4,173,518.18. Without this reduction, Tongass receipts would have been positive and totalled \$2,139,943.02. As a result of the negative receipt figure, no payments to the State of Alaska were made in Fiscal Year 1987.

3/ Does not include receipts foregone as a result of the Federal Timber Contract Payment Modification Act. Estimated total value of affected contracts was approximately \$54.5 million prior to the Act if all volume were harvested. Total value of the affected contracts as a result of the Act was approximately \$1.2 million. The difference of \$53.3 million represents receipts foregone, thus, the total Tongass receipts for the period fiscal years 1980-88 would have been \$126.8 million.

Source: USDA Forest Service, Alaska Region

Table 12. Tongass National Forest receipts ^{1/} by category in fiscal years 1980-88.

Fiscal Year	NFF Timber ^{2/}	KV ^{3/}	Purch Rds ^{4/}	Other ^{5/}	Total
1981	3,696,325.51	1,161,582.48	10,116,031.77	34,004.10	15,007,943.86
1982	2,486,464.15	2,600,637.67	16,422,412.69	113,249.44	21,622,763.95
1983 ^{6/}	(3,712,375.59)	626,670.19	8,229,572.89	222,047.91	5,365,915.40
1984 ^{7/}	3,552,077.07	(2,984,714.92)	3,272,618.12	223,208.35	4,063,188.62
1985 ^{8/}	374,965.96	1,159,349.77	(1,434,386.13)	109,301.53	209,231.13
1986 ^{9/}	(275,783.65)	357,510.39	1,716,670.50	168,842.27	1,967,239.51
1987 ^{10/}	287,304.59	411,604.20	(2,933,703.11)	201,219.16	(2,033,575.16)
1988	1,206,998.09	665,002.10	^{11/} (847,166.14)	^{12/} 207,837.67	1,232,671.72

1/ Capital investments such as permanent roads, bridges, log transfer facilities, and timber stand improvements also contribute to the total assets of the Tongass National Forest, reduce future management costs and are scheduled to achieve management objectives described in the Tongass Land Management Plan.

2/ Represents net stumpage returns to the National Forest Fund for timber.

3/ Collections made for the Knutson-Vandenburg Act fund, which finances timber sale improvements such as reforestation, thinning, and watershed/wildlife habitat protection.

4/ Credits made from the sale area to finance road construction by timber purchasers.

5/ These are receipts received or collected in other programs such as land use fees, mineral permits, special use fees, and recreation fees.

6/ Stumpage rate redeterminations required the refund of prior year collections in fiscal year 1983. Prior year payments were adjusted, resulting in a deficit balance.

7/ The rate redetermination resulted in over reporting of advance transfer for KV in prior year, requiring an adjustment in fiscal year 1984 and a deficit balance.

8/ Congress enacted the Federal Timber Contract Payment Modification Act (1984), P.L. 98-478. Independent timber sales in Alaska are eligible for emergency stumpage rate redeterminations, applied retroactive to all timber volume harvested since January 1, 1981.

9/ Refunds made under the Federal Timber Contract Payment Modification Act are reported in fiscal year 1986. This resulted in timber receipts and KV collections being reduced.

10/ The result of implementing the retroactive emergency stumpage rates on timber sale contracts provided under the authority the Federal Timber Contract Payment Modification Act, P.L. 98-478. The effects of the modification are: KV, -219,173.86; PC, -3,954,344.32; Total effects, -4,173,518.18.

11/ P.L. 100-202 provided that moneys received from the timber salvage sales program in fiscal year 1988 shall be considered as money required for the purposes of computing and distributing 25 per centum payments to local governments under 16 U.S.C. 500, as amended. For purposes of this table timber salvage sales earnings have been included in KV.

12/ The carryover adjustment from fiscal year 1987 resulting from implementation of retroactive emergency stumpage rates resulted in a credit purchaser road balance.

Source: USDA Forest Service, Alaska Region.

CONCLUSION

International exports, prices and employment in Southeast Alaska's forest products industry surpassed historic peaks in fiscal year 1988. Increased exports of logs, lumber and pulp reflected strong economic growth throughout the Pacific Rim and an internationally competitive United States dollar.

Robust growth in both the United States and Japanese economies has stimulated output and consumption in Taiwan, China, Hong Kong, Singapore and South Korea. In combination with the rapid growth of the printing and writing paper sector, the growth in these economies is strapping the capacity of Pacific Rim wood suppliers. Alaska's select grade logs and best dimension lumber are travelling to Japan where the stronger yen has given consumers tremendous buying power. Korean and Taiwanese manufactures are processing Alaska's construction grade logs and lumber both for domestic demand and exports to the Middle East.

While packaging papers and boards have followed industrial production upward across the Pacific Rim, it is the phenomenal growth in printing & writing papers which have driven pulp prices up for almost four years. The price increases affect Alaska in two ways. First, hardwood shipments from Southcentral Alaska have begun. Second, by absorbing dissolving pulp capacity elsewhere, the pressure on pulp prices have bolstered operating rates and profitability of pulp producers in Southeast Alaska.

Continued growth in all product sectors is expected for another year led by the Japan Paper Association's forecast for pulp demands in excess of announced capacity increase. All of the projected increase in Japan's pulp consumption is expected to come from increased imports of pulpwood and pulp. The strong pulp demand and the increasing value of the Canadian dollar has stimulated the export of Alaskan pulp logs to Canada.

Timber harvest on the Tongass National Forest in Southeast Alaska continues to increase. Since 1980, actual timber harvests on the Tongass have been below the timber supply provided by the Forest Plan due to macro-economic factors affecting the foreign exports of the United States. On average, 450 MMBF annually has been made available to the timber industry from the Tongass National Forest. Of the 450 MMBF made available about 89 percent has been purchased. Although the ANILCA timber supply and employment goal has been met, it is unlikely that an average of 450 MMBF of Tongass timber will be sold this decade. On the basis of Forest Plan criteria, a Tongass timber supply of 4.5 BBF per decade can be maintained.

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APPENDIX

*Appendix 1. Average annual accomplishment by volume class and source^{1/},
in fiscal years 1980-88*

Volume (MBF/Acre)	Plan Goal ^{2/}	Aeres Made Available		Total ^{3/}	Aeres Sold or Released		Total
		Short- Term	Long- Term		Short- Term	Long- Term	
8-20	4.7 (27%)	1.1	1.6	2.7 (19%)	0.6	1.6	2.2(18%)
20-30	6.6 (38%)	3.2	3.7	6.9 (47%)	2.0	3.7	5.7(46%)
30-50	4.5 (26%)	1.1	2.6	3.7 (26%)	0.8	2.6	3.4(27%)
50 +	1.5 (9%)	0.4	0.8	1.2 (8%)	0.3	0.8	1.1 (9%)
Total Acres(000's)	17.3 (100%)	5.8	8.7	14.5(100%)	3.7	8.7	12.4(100%)
Total Volume(MMBF)	450	140	310	450	90	310	400

Volume Class (MBF/Acre)	Plan Goal ^{2/}	Total Acres ^{3/} Made Available	Total Acres ^{3/} Sold or Released	Aeres Harvested (000's Acres)
8-20	4.7 (100%)	2.7 (57%)	2.2 (47%)	0.7 (15%)
20-30	6.6 (100%)	6.9(105%)	5.7 (86%)	3.0 (45%)
30-50	4.5 (100%)	3.7 (82%)	3.4 (76%)	2.7 (60%)
50 +	1.5 (100%)	1.2 (80%)	1.1 (73%)	0.8 (53%)
Total Acres(000's)	17.3 (100%)	14.5 (84%)	12.4 (72%)	7.2 (42%)

1/ In thousands of acres.

2/ Total acres under the plan goal include 970 acres per year from the allowable cut effect and 523 acres per year of advanced logging. While these 1493 acres were not disaggregated by volume class in the Forest Plan, they are broken down into their appropriate volume classes in this table.

3/ Monitoring of the Forest Plan is measured by decade on both the volume class and the total volume actually sold in short-term sales or released to the long-term operators. Total acres by volume class or total volume made available may exceed the Forest Plan goal for a given year or for the decade as long as the amount actually sold or released is not greater than the goals established in the forest plan. Harvest by volume class or total volume is not used as a monitoring or control standard since the scheduling and rate of harvest is controlled by the operator and is tied to contract periods and not Forest Plan periods.

Source: Timber Management Information Systems and Tongass Land Management Plan Evaluation Report and the 1985 Forest Plan Amendment Data Base.

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